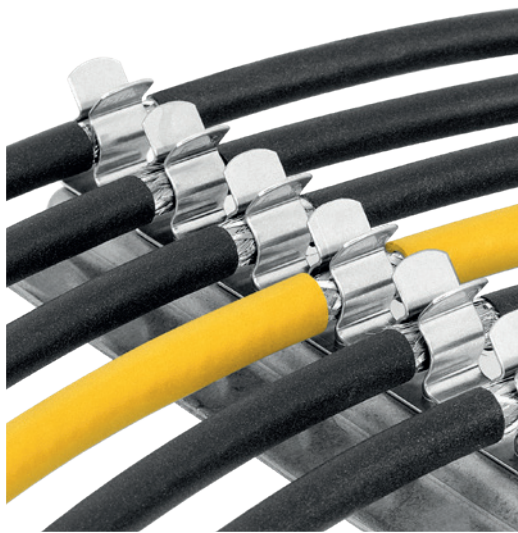
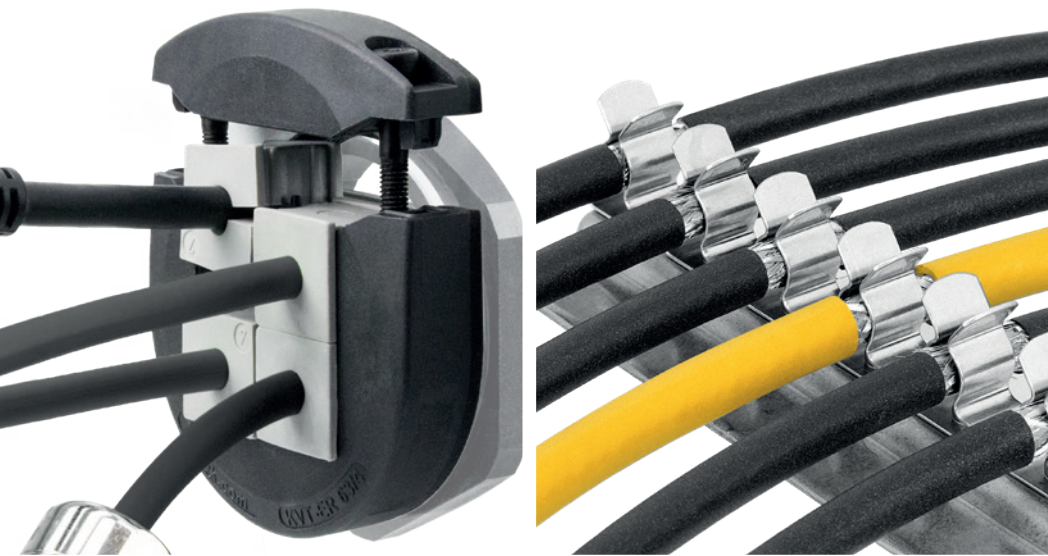


English

icotek[®]
smart cable management.



Product catalogue 34

Cable management systems

A company of the icotek group

smart cable management.

Ideas move the world – this has been our motto under which we have been developing innovative cable management systems since 1995. From our headquarters in Eschach, Germany, we produce our smart cable management solutions and distribute them in more than 60 countries. We are a strong and reliable partner for the industry together with our subsidiaries in Europe, China and North America as well as our global representatives. Globally leading companies from various sectors rely on our know-how and our innovative strength. Numerous patents and certifications are both an incentive and aspiration for us.

Product groups

	<p>1.11 Split cable entry frames for the KT grommet system (screw assembly)</p> <p>6 – 3</p>		<p>1.12 Split cable glands for the KT grommet system</p> <p>40 – 57</p>	<p>1.1 1.2</p>
	<p>1.13 IMAS-CONNECT™ Modular adapter system for the KT system</p> <p>58 – 67</p>		<p>1.21 Split cable entry frames for the QT grommet system (snap-in assembly)</p> <p>68 – 71</p>	<p>2.1 2.2</p>
	<p>1.22 Split cable glands for the QT grommet system</p> <p>72 – 75</p>		<p>1.23 Split cable entry plates for the QT grommet system (plug-in assembly)</p> <p>76 – 83</p>	<p>2.3</p>
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	<p>2.2 Cable entry plates for the food sector <i>Hygienic Design Line</i></p> <p>126 – 133</p>		<p>2.3 Flexible cable entry grommets for cables without connectors</p> <p>134 – 141</p>	<p>4.2 5</p>
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	<p>6 Enclosure accessories Gland plates, flange plates & accessories</p> <p>216 – 251</p>		<p>7 Cable pass-through with brush seal</p> <p>252 – 265</p>	<p>9 10</p>
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1 Cable entry systems for cables with connectors

1



Product group 1 includes all split cable entry systems in round and rectangular versions. Cables with and without preassembled connectors with a maximum diameter of 75 mm can thus be inserted. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.

By closing the upper and lower part of the frame a high contact pressure on the cable grommets and lines is achieved. In most cases, the lines are strain

relieved according to EN 62444 and immediately sealed with IP54 to IP66/IP68/UL type 4X (depending on type).

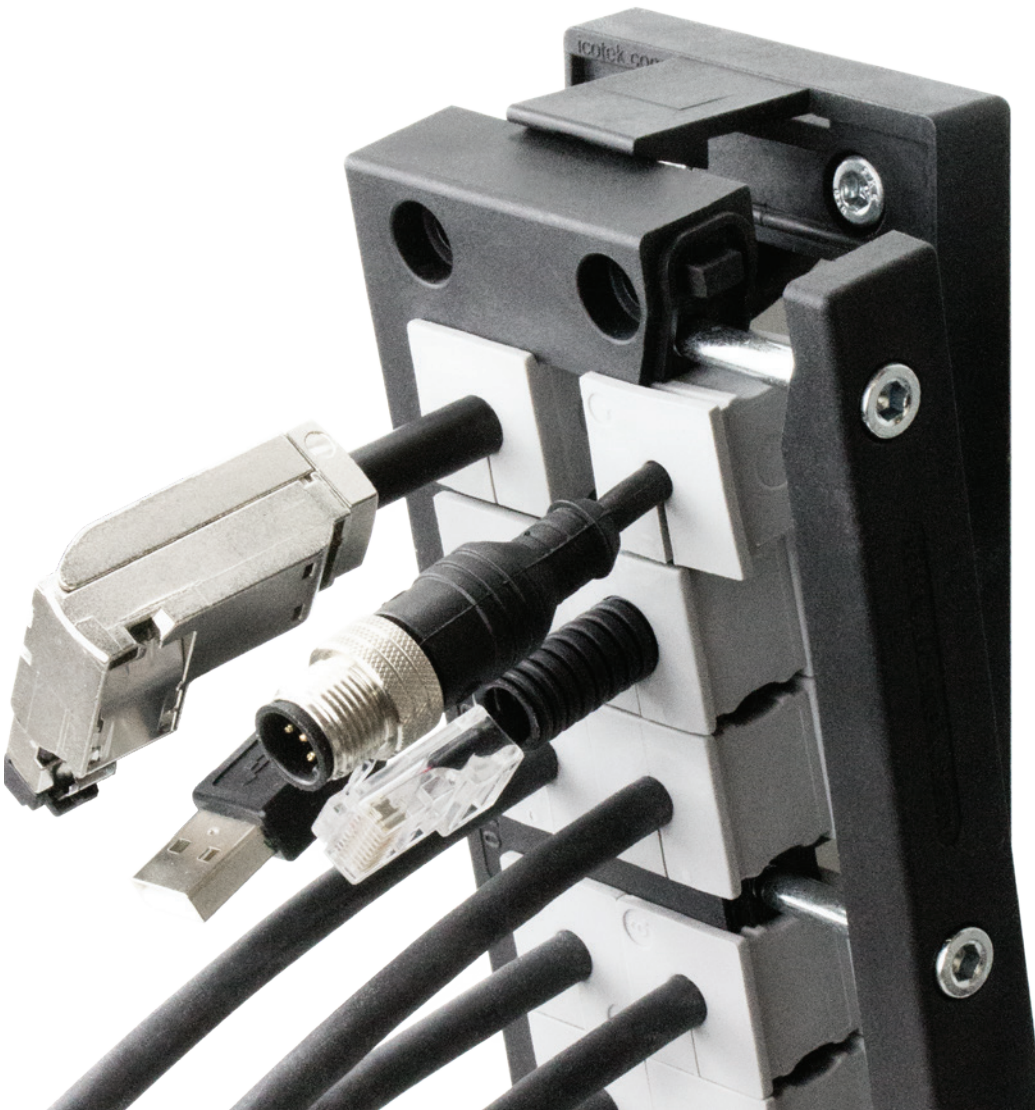
icotek also offers split and non-split brush plates for cable pass-through, based on rectangular and round standard cut-outs – a very cost-effective solution if sealing with IP54 is not required.



All icotek products with a type rating have been tested and certified by UL according to UL 50E! More information about UL Type Rating vs. NEMA Rating: www.icotek.com/en/ul-type-nema or in the appendix on page 291.



Configure your custom frames and grommets conveniently online with our Product Configurator on www.icotek.com



Product	IP54	IP66	IP68	UL TYPE 12	UL TYPE 4X	Strain relief	IMAS-CONNECT compatible	Cleanroom	Cable Ø mm min max	Max. no. of cables	Page
KEL-ER	■	■		■	■	■	■		1 – 35	10	8–10
KEL-ER-E	■	■		■		■	■		1 – 16	5	11
KEL-ER CR	■	■		■	■	■	■	■	1 – 35	10	278–279
KEL-U	■			■		■	■		1 – 35	40	12–14
KEL-U CR	■			■		■	■	■	1 – 35	40	279
KEL-E	■			■		■	■		1 – 16	20	15
KEL	■			■		■	■		1 – 35	40	16–24
KEL 16/24 Extensions	■					■	■		1 – 35	120	25
KEL-FG-A/B	■			■		■	■		1 – 35	40	30–32
KEL-FG-E	■			■		■	■		1 – 16	20	33
KEL-FL	■					■	■		1 – 16 + flat cables	13	28
KEL 183	■			■		■	■		1 – 75	16	26
KEL-SNAP(-S)	■								–	–	34–37
KEL-JUMBO	■			■		■	■		1 – 65	2	38
KVT-ER	■	■	■	■	■	■	■		1 – 35	4	40–43
KVT	■			■		■	■		1 – 35	16	44–45
KVT-SNAP	■					■	■		1 – 35	16	47
KVT-W90	■					■	■		1 – 35	16	48
KVT 80	■			■		■	■		1 – 35	24	46
KEL-QUICK	■			■			■		1 – 29	40	–
QVT	■						■		1 – 15	16	72–74
QVT-CLICK	■						■		1 – 29	16	75
KEL-QTA	■								1 – 15	26	76–79
KEL-QTE	■								1 – 15	2	76–79
KEL-BES / KEL-BES-S									max. 33		254–255

1.11 Split cable entry frames for the KT grommet system

1.11



The patented cable entry system enables the user to enter, seal and provide strain relief according to EN 62444 for pre-terminated cables (up to 65 mm in diameter) and cables without connectors (up to 75 mm in diameter).

Electrical, pneumatic or hydraulic lines as well as corrugated conduits and hoses can be easily routed, sealed and strain relieved using split cable entry systems.

The key feature of icotek's patented system is the split frame and split grommets which provide quick, convenient and cost effective routing of pre-terminated and multi-conductor cables, hoses and conduits. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.

Cables, pipes and conduits with various diameters can be routed due to a large variety of split grommets. When assembled correctly, the split grommets are held tightly within the frame. Correctly sizing the grommet to the cable diameter ensures a high degree of protection (up to IP66/UL type 4X) and provides strain relief.

Split system

Secure and tight connection

Maintain warranty on pre-terminated cables

Fast and easy assembly

Integrated strain relief according to EN 62444

Most sizes are industrial standard cut-outs. No need for additional tooling.

High cable density, wide variety in cable grommets and adapter grommets

Can be combined with IMAS-CONNECT grommets

**KEL-U/KEL: IP54 rated protection
KEL-ER: IP66 due to a high clamping pressure on the cover lid and injected sealing**

KEL 24/21-2 MT mounted with AT-M, equipped with M12 pressure compensation element, see page 65.

Chapter content



Split cable entry frames
for cable diameters up to 35 mm

KEL-ER 24 / KEL-ER 16 / KEL-ER 10 / KEL-ER-B
KEL-ER-E5 / KEL-ER-E4 / KEL-ER-E3 / KEL-ER-E2

8 – 11



Split cable entry frames
for cable diameters up to 35 mm

KEL-U 24 / KEL-U 16 / KEL-U 10 / KEL-U-B
KEL-E5 / KEL-E4 / KEL-E3 / KEL-E2

12 – 15



Centrally split cable entry frames
for cable diameters up to 35 mm

KEL 24 / KEL 16 / KEL 10 / KEL-B

16 – 19



Extended split cable entry frames
for cable diameters up to 35 mm

KEL 24-E / KEL 24-MT / KEL 24-2MT
KEL 16-E / KEL 16-MT / KEL 16-2MT

20 – 25



Split cable entry frames
for cable diameters up to 75 mm

KEL 183 / KEL 183-E / KTMB 183

26 – 27



Split cable entry frames for flat cables
& round cables up to 16 mm in diameter

KEL-FL / FT

28 – 29



Split flange enclosure
for cable diameters up to 35 mm

KEL-FG-A / KEL-FG-B /
KEL-FG-E5 / KEL-FG-E3 / KEL-FG-E2

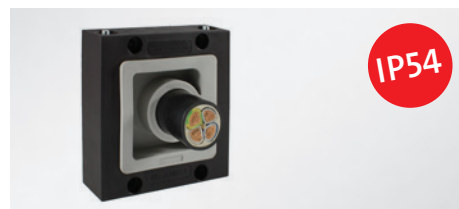
30 – 33



Snap mounting frames
for installation of KEL-U / KEL frames

KEL-SNAP-S / KEL-SNAP

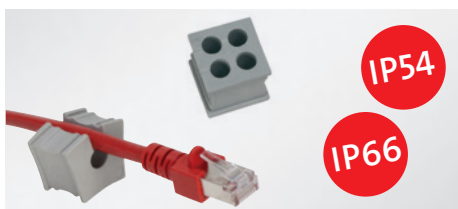
34 – 37



Split cable entry frames
for cable diameters up to 65 mm

KEL-JUMBO / KTF

38 – 39



Grommets and plugs
for cables with/without connectors,
cable diameter range 1 – 35 mm

KT small / KT large / KT-DPF / KTMB / KT-SC /
KT-DT / ST / KT Service Box

49 – 57



IMAS-CONNECT™
Modular adapter system
for the KT system

AT-FL / AT-PP / AT-KS / AT-K-M / AT-M /
AT-B / PCE / Accessories

58 – 67

Cable entry frames with IP66 rating KEL-ER series

1.11

Product description

Split cable entry system for routing and sealing cables with connectors, providing an IP66/UL Type 12/4X rating and strain relief for cable diameters from 1 to 17 mm (single-hole grommets KT1 to KT17) and 16 to 35 mm (single-hole grommets KT16 to KT34).

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The KEL-ER frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The KEL-ER-B frame matches the cut-out dimensions of 46 x 46 mm measuring instruments.

The single-row versions KEL-ER-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space. A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP66, with gasket and correct selection of single grommets (certified acc. to EN 60529)
UL type rating	UL type 4X (acc. to UL 50E)
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	49 – 52
AT Adapter grommets	60 – 64
KEL-EMC Cable collectors	186 – 188
ST Plugs	55



Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets



i The KEL-ER series is also available as a cleanroom version, see from page 278.

KEL-ER

Cable entry frames KEL-ER 24, KEL-ER 16

1.11


Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-ER 24 10	36/46 × 112	10 -	48241	10
		KEL-ER 24 10 with V2A screws	36/46 × 112	10 -	48241.200	10
		KEL-ER 24 10 with threaded bushings M4	36/46 × 112	10 -	48241.400	10
		KEL-ER 24 7	36/46 × 112	6 1	48247	10
		KEL-ER 24 7 with V2A screws	36/46 × 112	6 1	48247.200	10
		KEL-ER 24 7 with threaded bushings M4	36/46 × 112	6 1	48247.400	10
		KEL-ER 24 4	36/46 × 112	2 2	48244	10
		KEL-ER 24 4 with V2A screws	36/46 × 112	2 2	48244.200	10
		KEL-ER 24 4 with threaded bushings M4	36/46 × 112	2 2	48244.400	10
		KEL-ER 16 8	36/46 × 86	8 -	48168	10
		KEL-ER 16 8 with V2A screws	36/46 × 86	8 -	48168.200	10
		KEL-ER 16 8 with threaded bushings M4	36/46 × 86	8 -	48168.400	10
		KEL-ER 16 5	36/46 × 86	4 1	48165	10
		KEL-ER 16 5 with V2A screws	36/46 × 86	4 1	48165.200	10
		KEL-ER 16 5 with threaded bushings M4	36/46 × 86	4 1	48165.400	10
		KEL-ER 16 2	36/46 × 86	- 2	48162	10
		KEL-ER 16 2 with V2A screws	36/46 × 86	- 2	48162.200	10
		KEL-ER 16 2 with threaded bushings M4	36/46 × 86	- 2	48162.400	10

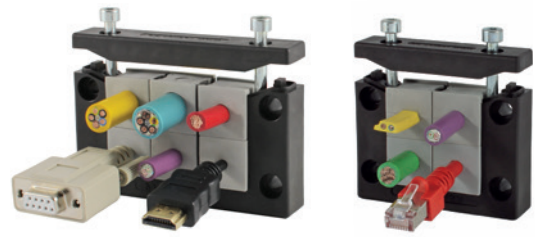
KEL-ER

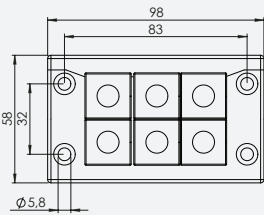
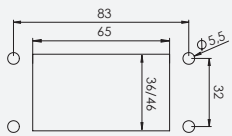
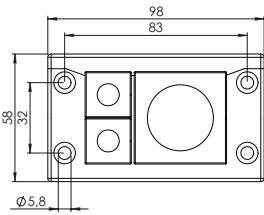
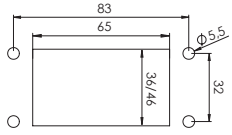
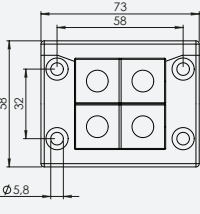
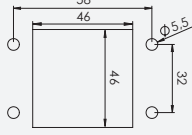
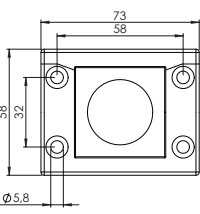
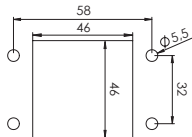
Cable entry frames

KEL-ER 10, KEL-ER B

1.11

IP66



Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-ER 10 6	36/46 × 65	6 -	48216	10
		KEL-ER 10 6 with V2A screws	36/46 × 65	6 -	48216.200	10
		KEL-ER 10 6 with threaded bushings M4	36/46 × 65	6 -	48216.400	10
		KEL-ER 10 3	36/46 × 65	2 1	48212	10
		KEL-ER 10 3 with V2A screws	36/46 × 65	2 1	48212.200	10
		KEL-ER 10 3 with threaded bushings M4	36/46 × 65	2 1	48212.400	10
		KEL-ER-B4	46 × 46	4 -	48204	10
		KEL-ER-B4 with V2A screws	46 × 46	4 -	48204.200	10
		KEL-ER-B4 with threaded bushings M4	46 × 46	4 -	48204.400	10
		KEL-ER-B1	46 × 46	- 1	48206	10
		KEL-ER-B1 with V2A screws	46 × 46	- 1	48206.200	10
		KEL-ER-B1 with threaded bushings M4	46 × 46	- 1	48206.400	10



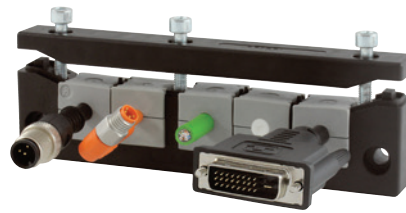
The KEL-ER series is also available as a cleanroom version, see from page 278.

KEL-ER

Cable entry frames

KEL-ER-E

1.11


IP66

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-ER-E5	112 × 24	5 -	48250	10
		KEL-ER-E5 with V2A screws	112 × 24	5 -	48250.200	10
		KEL-ER-E5 with threaded bushings M4	112 × 24	5 -	48250.400	10
		KEL-ER-E4	112 × 24	4 -	48259	10
		KEL-ER-E4 with V2A screws	112 × 24	4 -	48259.200	10
		KEL-ER-E4 with threaded bushings M4	112 × 24	4 -	48259.400	10
		KEL-ER-E3	65 × 24	3 -	48258	10
		KEL-ER-E3 with V2A screws	65 × 24	3 -	48258.200	10
		KEL-ER-E3 with threaded bushings M4	65 × 24	3 -	48258.400	10
		KEL-ER-E2	43 × 24	2 -	48249	10
		KEL-ER-E2 with V2A screws	43 × 24	2 -	48249.200	10
		KEL-ER-E2 with threaded bushings M4	43 × 24	2 -	48249.400	10



The KEL-ER series is also available as a cleanroom version, see from page 278.

Cable entry frames with IP54 rating KEL-U series

1.11

Product description

Split cable entry system for routing cables with connectors providing an IP54/UL Type 12 rating. Routing, sealing and providing strain relief for cable diameters from 1 to 35 mm.

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The KEL-U frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The KEL-U-B frame matches the cut-out dimensions of 46 × 46 mm measuring instruments. For tool-free assembly/disassembly of the cable entry frames the snap mounting frame KEL-SNAP can be used.

The single-row versions KEL-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space. A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Fast and easy assembly
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	49 - 52
AT Adapter grommets	60 - 64
KEL-SNAP Mounting frames	34 - 37
KEL-EMC Cable collectors	186 - 189
KDR Base plates	218 - 229
FP Flange plates	236 - 245
ST Plugs	55



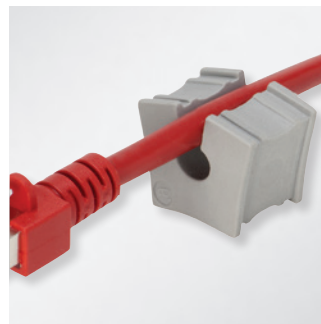
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets



The KEL-U series is also available as a cleanroom version, see from page 279.

KEL-U

Cable entry frames KEL-U 24, KEL-U 16

1.11



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-U 24 10	36/46 × 112	10 -	54241	10
		KEL-U 24 10 with V2A screws	36/46 × 112	10 -	54241.200	10
		KEL-U 24 10 with threaded bushings M4	36/46 × 112	10 -	54241.400	10
		KEL-U 24 7	36/46 × 112	6 1	54247	10
		KEL-U 24 7 with V2A screws	36/46 × 112	6 1	54247.200	10
		KEL-U 24 7 with threaded bushings M4	36/46 × 112	6 1	54247.400	10
		KEL-U 24 4	36/46 × 112	2 2	54244	10
		KEL-U 24 4 with V2A screws	36/46 × 112	2 2	54244.200	10
		KEL-U 24 4 with threaded bushings M4	36/46 × 112	2 2	54244.400	10
		KEL-U 16 8	36/46 × 86	8 -	54168	10
		KEL-U 16 8 with V2A screws	36/46 × 86	8 -	54168.200	10
		KEL-U 16 8 with threaded bushings M4	36/46 × 86	8 -	54168.400	10
		KEL-U 16 5	36/46 × 86	4 1	54165	10
		KEL-U 16 5 with V2A screws	36/46 × 86	4 1	54165.200	10
		KEL-U 16 5 with threaded bushings M4	36/46 × 86	4 1	54165.400	10
		KEL-U 16 2	36/46 × 86	- 2	54162	10
		KEL-U 16 2 with V2A screws	36/46 × 86	- 2	54162.200	10
		KEL-U 16 2 with threaded bushings M4	36/46 × 86	- 2	54162.400	10

KEL-U

Cable entry frames

KEL-U 10, KEL-U-B

1.11

IP54



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-U 10 6	36/46 × 65	6 -	54216	10
		KEL-U 10 6 with V2A screws	36/46 × 65	6 -	54216.200	10
		KEL-U 10 6 with threaded bushings M4	36/46 × 65	6 -	54216.400	10
		KEL-U 10 3	36/46 × 65	2 1	54212	10
		KEL-U 10 3 with V2A screws	36/46 × 65	2 1	54212.200	10
		KEL-U 10 3 with threaded bushings M4	36/46 × 65	2 1	54212.400	10
		KEL-U-B4	46 × 46	4 -	54204	10
		KEL-U-B4 with V2A screws	46 × 46	4 -	54204.200	10
		KEL-U-B4 with threaded bushings M4	46 × 46	4 -	54204.400	10
		KEL-U-B1	46 × 46	- 1	54206	10
		KEL-U-B1 with V2A screws	46 × 46	- 1	54206.200	10
		KEL-U-B1 with threaded bushings M4	46 × 46	- 1	54206.400	10

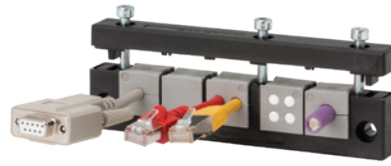


The KEL-U series is also available as a clean room version, see from page 279.

KEL-E

Cable entry frames

1.11


IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-E2	43 × 24	2 –	42249	10
		KEL-E2 with V2A screws	43 × 24	2 –	42249.200	10
		KEL-E2 with threaded bushings M4	43 × 24	2 –	42249.400	10
		KEL-E3	65 × 24	3 –	42258	10
		KEL-E3 with V2A screws	65 × 24	3 –	42258.200	10
		KEL-E3 with threaded bushings M4	65 × 24	3 –	42258.400	10
		KEL-E4	86 × 24	4 –	42259	10
		KEL-E4 with V2A screws	86 × 24	4 –	42259.200	10
		KEL-E4 with threaded bushings M4	86 × 24	4 –	42259.400	10
		KEL-E5	112 × 24	5 –	42250	10
		KEL-E5 with V2A screws	112 × 24	5 –	42250.200	10
		KEL-E5 with threaded bushings M4	112 × 24	5 –	42250.400	10

Cable entry frames with IP54 rating KEL series

1.11

Product description

The classic KEL is a centrally split cable entry system for routing cables with connectors, providing an IP54/up to UL Type 12 rating.

The split KT grommet matching the cable diameter is placed around the cable and inserted into the cable entry frame. The split cable entry frames KEL match exactly the cut-out dimensions of 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The size KEL-B matches the cut-out dimensions of 46 × 46 mm measuring instruments.

Based on the frame sizes KEL 16 and KEL 24, there are also extended versions with additional middle frames available. Thus allowing a quick, easy and cost effective routing solution for up to 120 cables or hoses.

For tool-free assembly/disassembly of the cable entry frames the snap mounting frame KEL-SNAP can be used. All frame systems come with a rubber gasket.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	49 - 52
AT Adapter grommets	60 - 64
KEL-SNAP Mounting frames	34 - 37
KEL-EMC Cable collectors	186 - 189
KDR Base plates	218 - 229
FP Flange plates	236 - 245
MP Module plates	230 - 231
ST Plugs	55



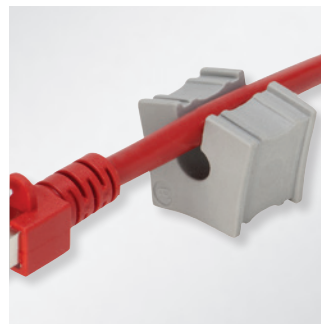
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets



Can be combined with IMAS-CONNECT adapter grommets

KEL

Cable entry frames

KEL 24

1.11

IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 10	36/46 × 112	10 -	42241	10
		KEL 24 10 with V2A screws	36/46 × 112	10 -	42241.200	10
		KEL 24 10 with threaded bushings M4	36/46 × 112	10 -	42241.400	10
		KEL 24 7	36/46 × 112	6 1	42247	10
		KEL 24 7 with V2A screws	36/46 × 112	6 1	42247.200	10
		KEL 24 7 with threaded bushings M4	36/46 × 112	6 1	42247.400	10
		KEL 24 5	36/46 × 112	5 -	42248	10
		KEL 24 5 with V2A screws	36/46 × 112	5 -	42248.200	10
		KEL 24 5 with threaded bushings M4	36/46 × 112	5 -	42248.400	10
		KEL 24 4	36/46 × 86	2 2	42244	10
		KEL 24 4 with V2A screws	36/46 × 86	2 2	42244.200	10
		KEL 24 4 with threaded bushings M4	36/46 × 86	2 2	42244.400	10

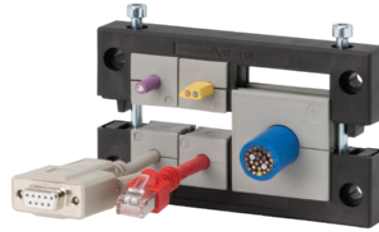
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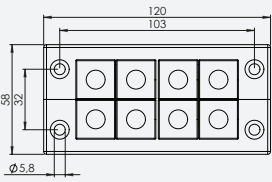
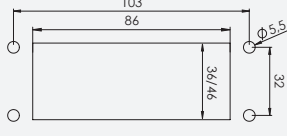
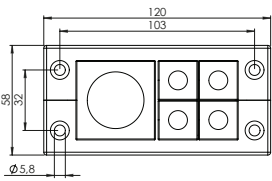
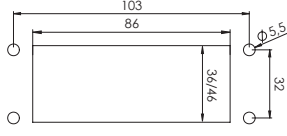
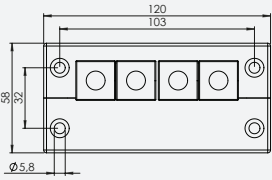
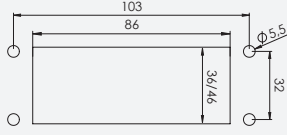
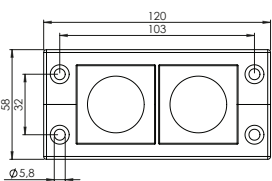
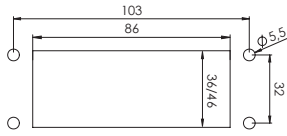
Cable entry frames

KEL 16

1.11

IP54



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 8	36/46 × 86	8 -	42168	10
		KEL 16 8 with V2A screws	36/46 × 86	8 -	42168.200	10
		KEL 16 8 with threaded bushings M4	36/46 × 86	8 -	42168.400	10
		KEL 16 5	36/46 × 86	4 1	42165	10
		KEL 16 5 with V2A screws	36/46 × 86	4 1	42165.200	10
		KEL 16 5 with threaded bushings M4	36/46 × 86	4 1	42165.400	10
		KEL 16 4	36/46 × 86	4 -	42164	10
		KEL 16 4 with V2A screws	36/46 × 86	4 -	42164.200	10
		KEL 16 4 with threaded bushings M4	36/46 × 86	4 -	42164.400	10
		KEL 16 2	36/46 × 86	- 2	42162	10
		KEL 16 2 with V2A screws	36/46 × 86	- 2	42162.200	10
		KEL 16 2 with threaded bushings M4	36/46 × 86	- 2	42162.400	10

KEL

Cable entry frames

KEL 10, KEL-B

1.11



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 10 6	36/46 × 65	6 -	42216	10
		KEL 10 6 with V2A screws	36/46 × 65	6 -	42216.200	10
		KEL 10 6 with threaded bushings M4	36/46 × 65	6 -	42216.400	10
		KEL 10 3	36/46 × 65	2 1	42212	10
		KEL 10 3 with V2A screws	36/46 × 65	2 1	42212.200	10
		KEL 10 3 with threaded bushings M4	36/46 × 65	2 1	42212.400	10
		KEL-B4	46 × 46	4 -	42204	10
		KEL-B4 with V2A screws	46 × 46	4 -	42204.200	10
		KEL-B4 with threaded bushings M4	46 × 46	4 -	42204.400	10
		KEL-B1	46 × 46	- 1	42206	10
		KEL-B1 with V2A screws	46 × 46	- 1	42206.200	10
		KEL-B1 with threaded bushings M4	46 × 46	- 1	42206.400	10

Cable entry frames, extended with IP54 rating KEL series

1.11

Product description

Based on the frame sizes KEL 16 and KEL 24, there are also extended versions with additional middle frames available. Thus allowing a quick, easy and cost effective routing solution for up to 120 cables or hoses.

A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets
- Great variability in the cable grommets

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-o, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	49 - 52
AT Adapter grommets	60 - 64
KEL-SNAP Mounting frames	34 - 37
KEL-EMC Cable collectors	186 - 189
ST Plugs	55



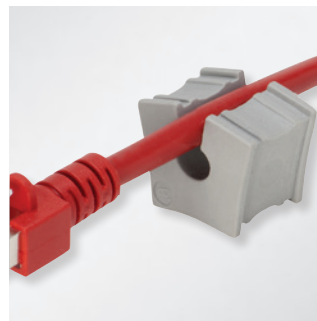
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



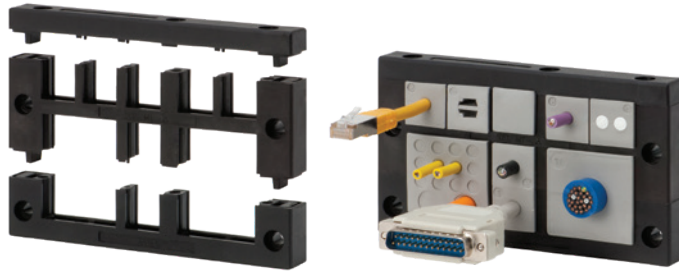
Split KT grommets

KEL

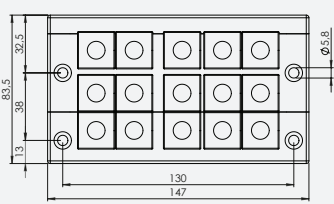
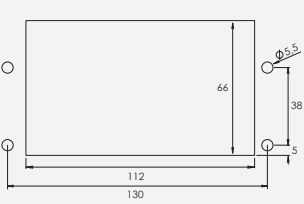
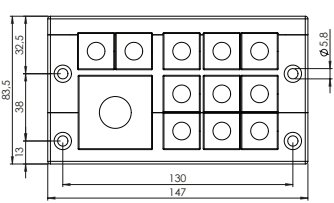
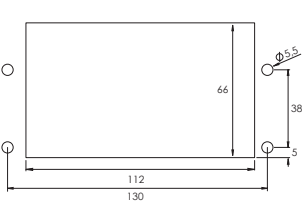
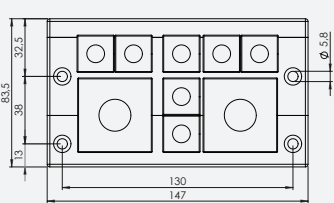
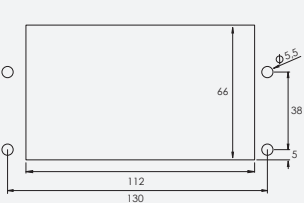
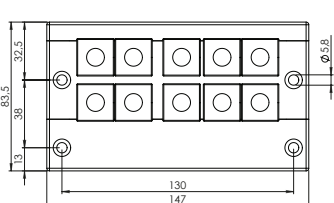
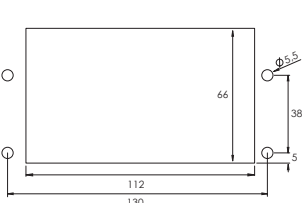
Cable entry frames

KEL-24-E

1.11



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 15-E	66 x 112	15 -	42209	1
		KEL 24 15-E with V2A screws	66 x 112	15 -	42209.200	1
		KEL 24 15-E with threaded bushings M4	66 x 112	15 -	42209.400	1
		KEL 24 12-E	66 x 112	11 1	42208	1
		KEL 24 12-E with V2A screws	66 x 112	11 1	42208.200	1
		KEL 24 12-E with threaded bushings M4	66 x 112	11 1	42208.400	1
		KEL 24 9-E	66 x 112	7 2	42207	1
		KEL 24 9-E with V2A screws	66 x 112	7 2	42207.200	1
		KEL 24 9-E with threaded bushings M4	66 x 112	7 2	42207.400	1
		KEL 24 10-E	66 x 112	10 -	49056	1
		KEL 24 10-E with V2A screws	66 x 112	10 -	49056.200	1
		KEL 24 10-E with threaded bushings M4	66 x 112	10 -	49056.400	1

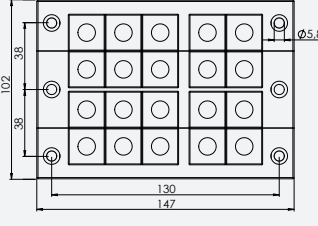
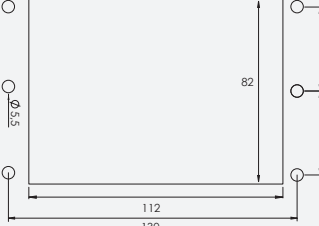
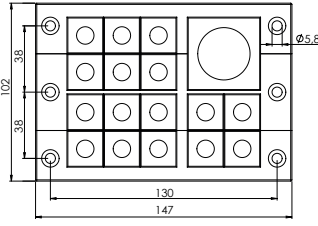
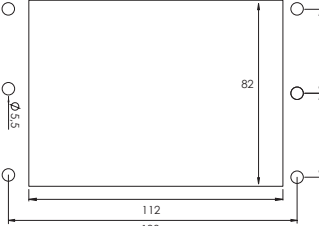
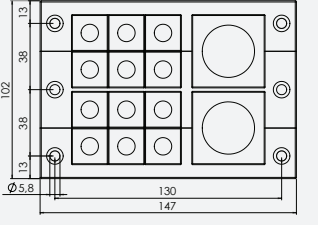
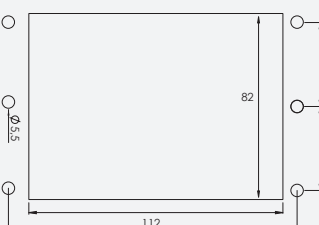
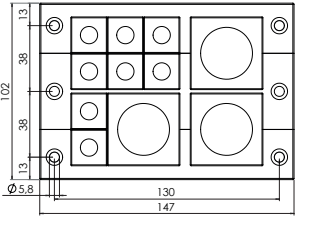
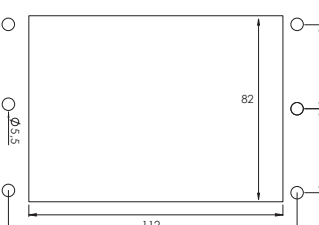
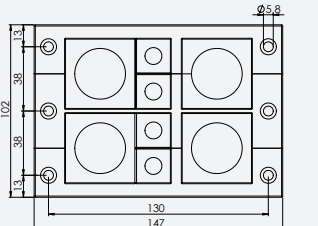
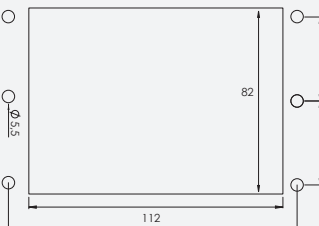
KEL

Cable entry frames

KEL-24-MT

1.11



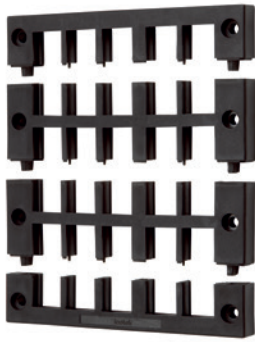
Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 20-MT	82 x 112	20 -	42232	1
		KEL 24 20-MT with V2A screws	82 x 112	20 -	42232.200	1
		KEL 24 20-MT with threaded bushings M4	82 x 112	20 -	42232.400	1
		KEL 24 17-MT	82 x 112	16 1	42224	1
		KEL 24 17-MT with V2A screws	82 x 112	16 1	42224.200	1
		KEL 24 17-MT with threaded bushings M4	82 x 112	16 1	42224.400	1
		KEL 24 14-MT	82 x 112	12 2	42225	1
		KEL 24 14-MT with V2A screws	82 x 112	12 2	42225.200	1
		KEL 24 14-MT with threaded bushings M4	82 x 112	12 2	42225.400	1
		KEL 24 11-MT	82 x 112	8 3	42222	1
		KEL 24 11-MT with V2A screws	82 x 112	8 3	42222.200	1
		KEL 24 11-MT with threaded bushings M4	82 x 112	8 3	42222.400	1
		KEL 24 8-MT	82 x 112	4 4	42221	1
		KEL 24 8-MT with V2A screws	82 x 112	4 4	42221.200	1
		KEL 24 8-MT with threaded bushings M4	82 x 112	4 4	42221.400	1

KEL

Cable entry frames

KEL-24-2MT

1.11



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 30-2MT	126 x 112	30 -	42234	1
		KEL 24 30-2MT with V2A screws	126 x 112	30 -	42234.200	1
		KEL 24 30-2MT with threaded bushings M4	126 x 112	30 -	42234.400	1
		KEL 24 27-2MT	126 x 112	26 1	42233	1
		KEL 24 27-2MT with V2A screws	126 x 112	26 1	42233.200	1
		KEL 24 27-2MT with threaded bushings M4	126 x 112	26 1	42233.400	1
		KEL 24 24-2MT	126 x 112	22 2	42227	1
		KEL 24 24-2MT with V2A screws	126 x 112	22 2	42227.200	1
		KEL 24 24-2MT with threaded bushings M4	126 x 112	22 2	42227.400	1
		KEL 24 21-2MT	126 x 112	18 3	42226	1
		KEL 24 21-2MT with V2A screws	126 x 112	18 3	42226.200	1
		KEL 24 21-2MT with threaded bushings M4	126 x 112	18 3	42226.400	1
		KEL 24 12-2MT	126 x 112	6 6	42223	1
		KEL 24 12-2MT with V2A screws	126 x 112	6 6	42223.200	1
		KEL 24 12-2MT with threaded bushings M4	126 x 112	6 6	42223.400	1

KEL

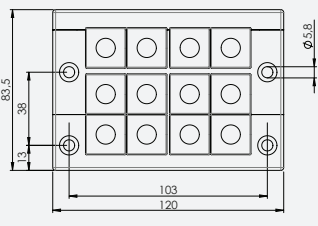
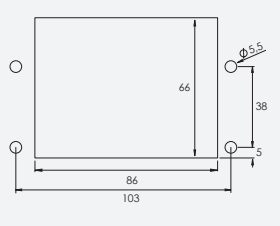
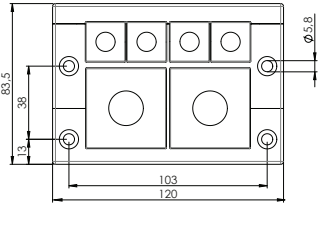
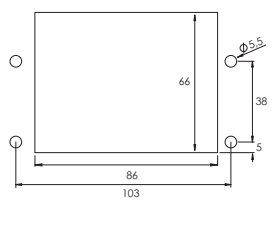
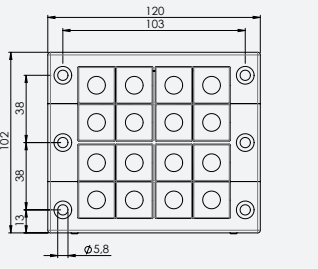
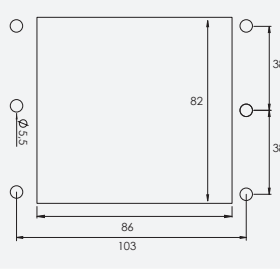
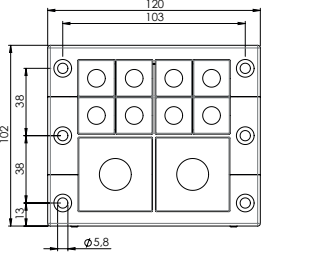
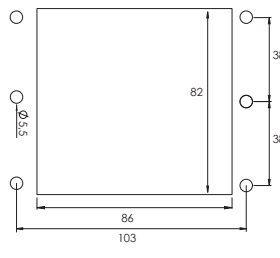
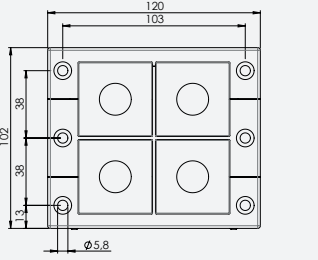
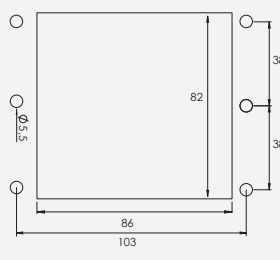
Cable entry frames

KEL 16-E, KEL 16-MT

1.11

IP54



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 12-E	66 x 86	12 -	42141	1
		KEL 16 12-E with V2A screws	66 x 86	12 -	42141.200	1
		KEL 16 12-E with threaded bushings M4	66 x 86	12 -	42141.400	1
		KEL 16 6-E	66 x 86	4 2	42140	1
		KEL 16 6-E with V2A screws	66 x 86	4 2	42140.200	1
		KEL 16 6-E with threaded bushings M4	66 x 86	4 2	42140.400	1
		KEL 16 16-MT	82 x 86	16 -	42145	1
		KEL 16 16-MT with V2A screws	82 x 86	16 -	42145.200	1
		KEL 16 16-MT with threaded bushings M4	82 x 86	16 -	42145.400	1
		KEL 16 10-MT	82 x 86	8 2	42144	1
		KEL 16 10-MT with V2A screws	82 x 86	8 2	42144.200	1
		KEL 16 10-MT with threaded bushings M4	82 x 86	8 2	42144.400	1
		KEL 16 4-MT	82 x 86	- 4	42143	1
		KEL 16 4-MT with V2A screws	82 x 86	- 4	42143.200	1
		KEL 16 4-MT with threaded bushings M4	82 x 86	- 4	42143.400	1

KEL

Cable entry frames

KEL 16-2MT

1.11



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 24-2MT	126 x 86	24 -	42149	1
		KEL 16 24-2MT with V2A screws	126 x 86	24 -	42149.200	1
		KEL 16 24-2MT with threaded bushings M4	126 x 86	24 -	42149.400	1
		KEL 16 12-2MT	126 x 86	8 4	42148	1
		KEL 16 12-2MT with V2A screws	126 x 86	8 4	42148.200	1
		KEL 16 12-2MT with threaded bushings M4	126 x 86	8 4	42148.400	1
		KEL 16 6-2MT	126 x 86	- 6	42147	1
		KEL 16 6-2MT with V2A screws	126 x 86	- 6	42147.200	1
		KEL 16 6-2MT with threaded bushings M4	126 x 86	- 6	42147.400	1

KEL 183

Cable entry frames for supply cables

KEL 183, KEL 183-E

1.11



Description	Cut-out Drilling template	Type	Cut-out mm	Grommets KT KT 183 KT large	Order No.	PU
		KEL 183 2	180 x 80 mm	2 -	47200	1
		KEL 183 2 with V2A screws	180 x 80 mm	2 -	47200.200	1
		KEL 183 5	180 x 80 mm	1 4	47220	1
		KEL 183 5 with V2A screws	180 x 80 mm	1 4	47220.200	1
		KEL 183 8	180 x 80 mm	- 8	47240	1
		KEL 183 8 with V2A screws	180 x 80 mm	- 8	47240.200	1
		KEL 183-E4	180 x 42 mm	- 4	47250	1
		KEL 183-E4 with V2A screws	180 x 42 mm	- 4	47250.200	1
		KEL 183-E16	180 x 42 mm	16 KT small	47255	1
		KEL 183-E16 with V2A screws	180 x 42 mm	16 KT small	47255.200	1

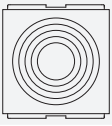
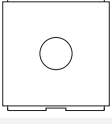
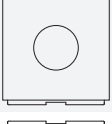
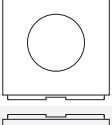
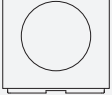
KTMB 183

Grommets for KEL 183

1.11



IP54

Type	Order No.	Clamping range	PU
 KTMB-O	41410	Blank grommet	1
 KTMB-P	41415	34 – 44 mm	1
 KTMB-Q	41420	44 – 54 mm	1
 KTMB-R	41425	54 – 64 mm	1
 KTMB-S	41430	64 – 75 mm	1

Product description

The split cable entry frame KEL 183 enables the user to route cables and tubes with a diameter of up to 75 mm (depending on the frame type) and to seal them in accordance with IP54/up to UL type 12. For cables up to 35 mm the cable grommets KT can be used. With these split cable grommets, pre-terminated cables can be routed.

For cables up to 75 mm we have created the grommets KTMB for KEL 183. Those are not split and have a defined area for pushing the cable through.

The blank grommet KTMB-O can accept cable sizes within a specified range. The membrane of the KTMB-O can be pierced or cut (cable diameter minus 10 mm) for cables up to 55 mm in diameter.

All frame systems come with a rubber gasket.

Advantages & benefits

- Installation of cables up to 75 mm
- Grommets allow rigid cables to be properly positioned and oriented during the installation process
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- Can be combined with IMAS-CONNECT adapter grommets
- Great variability in the cable grommets

Specifications

Material	KEL 183: Polyamide (PA) KTMB: Elastomere
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54 with gasket and correct selection of the cables (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	KEL 183: -40°C to +140°C (static) KTMB: -40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	50 - 52
AT Adapter grommets	60 - 64
KEL-EMC Cable collectors	186 - 189
ST Plugs	55



KEL-FL

Cable entry frames for flat cables

1.11

IP54



Description	Cut-out Drilling template	Type	Order No.	Cut-out [mm]	Grommets KT FT	PU
		KEL-FL A	46100	43 × 24	0× KT 1× FT-1	10
		KEL-FL B	46105	65 × 24	0× KT 1× FT-2	10
		KEL-FL C	46110	65 × 24	1× KT 1× FT-1	10
		KEL-FL D	46115	86 × 24	0× KT 1× FT-3	10
		KEL-FL E	46120	86 × 24	1× KT 1× FT-2	10
		KEL-FL F	46125	86 × 24	0× KT 2× FT-1	10
		KEL-FL G	46130	86 × 24	2× KT 1× FT-1	10
		KEL-FL H	46135	112 × 24	2× KT 1× FT-2	10
		KEL-FL I	46140	112 × 24	1× KT 2× FT-1	10
		KEL-FL J	46145	112 × 24	3× KT 1× FT-1	10
		KEL-FL K	46150	112 × 24	1× FT-1 1× FT-2	10
		KEL-FL L	46155	112 × 24	1× FT-4	10

FT Grommets for flat cables

1.11



IP54

Description	Type	Order No.	Clamping range	PU
	FT-1 0	46201	Blank grommet	5
	FT-1 A	46210	Width: 19 - 23 mm Thickness: 5.5 - 6 mm	5
	FT-1 B	46211	Width: 28 - 33 mm Thickness: 5.5 - 6 mm	5
	FT-1 C	46212	Width: 24 - 30 mm Thickness: 8.5 - 9 mm	5
	FT-1 E	46214	Width: 19 - 24 mm Thickness: 6.5 - 7 mm	5
	FT-1 F	46215	Width: 28 - 33 mm Thickness: 9 - 9.5 mm	5
	FT-2 0	46202	Blank grommet	5
	FT-2 A	46250	Width: 32.5 - 38 mm Thickness: 5 - 5.5 mm	5
	FT-2 B	46251	Width: 45 - 50.5 mm Thickness: 6 - 6.5 mm	5
	FT-2 C	46252	Width: 47 - 52 mm Thickness: 9.5 - 10 mm	5
	FT-2 F	46255	Width: 38 - 43 mm Thickness: 12.5 - 13 mm	5
	FT-2 G	46256	Width: 49 - 54 mm Thickness: 5 - 6 mm	5
	FT-3 0	46203	Blank grommet	5
	FT-3 A	46300	Width: 72 - 77 mm Thickness: 5 - 5.5 mm	5
	FT-4 0	46204	Blank grommet	5
	FT-4 A	46330	Width: 85 - 99 mm Thickness: 4.2 - 5.2 mm	5

Product description

The KEL-FL range enables simple, fast and flexible cable routing and sealing of flat wires, e.g. in lift construction.

Innovative construction of the grommets compensates for manufacturing inconsistencies in flat cables. Split KT grommets can be utilised to additionally route round cables with connectors. All frame systems come with a rubber gasket.

FT grommets are used to route flat cables, e.g. in lift construction. Suitable for cable entry frames KEL-FL. Innovative construction of the grommets compensates for manufacturing inconsistencies in flat cables.

Advantages & benefits

- Routing of flat cables in combination with pre-terminated round cables by using a single KEL-FL cable entry frame
- Routing of flat cables with various dimensions
- Space saving shape

Specifications

Material	KEL-FL: Polyamide (PA)
Flame class	FT: Elastomer
IP rating	UL 94 V-0, self-extinguishing IP54, with gasket and correct selection of the cable grommets
Temperature	KEL-FL: -40°C to +140°C (static) FT: -40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets, small	50 - 52
KTMB/KT-DPF Cable grommets, small	53
KEL-EMC Cable collectors	186 - 189
ST Plugs	55

Flange enclosures for cable entry with IP54 rating KEL-FG series

1.11

Product description

The cable entry frames KEL-FG are suited for installation, sealing and strain relief of cables with connectors and conduits at an angle of 90° to the cabinet, enclosure or machine wall.

The KEL-FG-A frame matches exactly the cut-out dimensions for 24-pin standard industrial connectors. For tool-free assembly/disassembly of the KEL-FG-A the snap mounting frame KEL-SNAP 24 can be used. The KEL-FG-B is suited for cut-outs 36 × 46 mm.

The single-row versions KEL-FG-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

A flat rubber gasket is included in the shipment.

Advantages & benefits

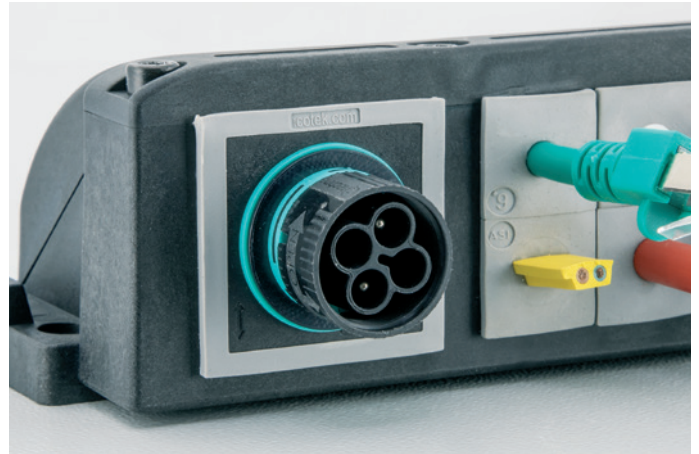
- Installation at an angle of 90° to the wall
- Mechanical protection of cable directly at the place of entry
- Protection against water spray and drips
- Maintain manufacturer's warranty on pre-terminated cables
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets.

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free

Accessories

KT Cable grommets	49 - 52
AT Adapter grommets	60 - 64
KEL-SNAP Mounting frames	34 - 37
KEL-EMC Cable collectors	186 - 189
ST Plugs	55



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



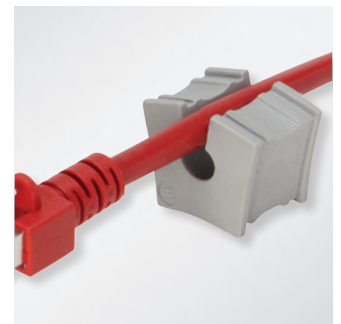
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



KEL-FG-A

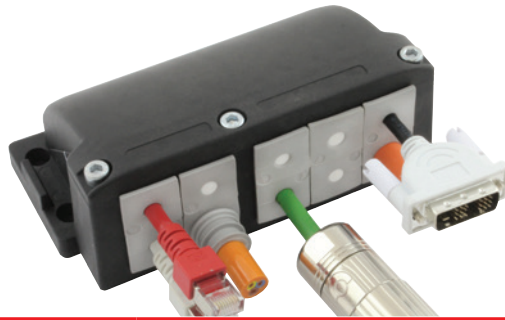


Split KT grommets

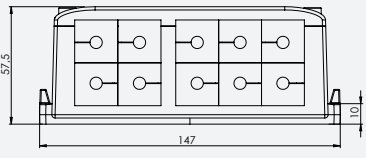
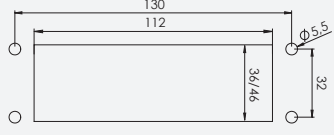
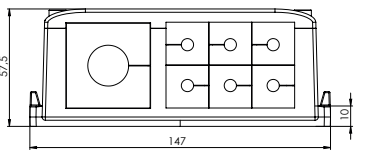
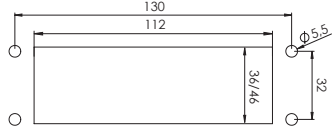
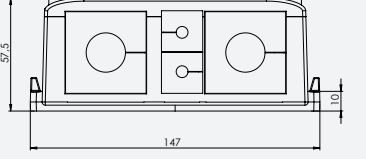
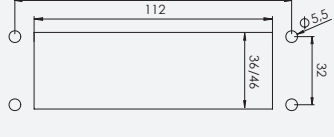
KEL-FG

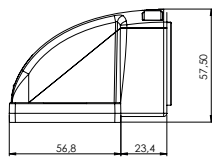
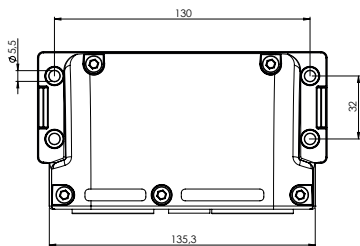
Flange enclosures for cable entry KEL-FG-A

1.11



IP54

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-A10	36 x 112	10 -	42320	1
		KEL-FG-A10 with V2A screws	36 x 112	10 -	42320.200	1
		KEL-FG-A10 with threaded bushings M4	36 x 112	10 -	42320.400	1
		KEL-FG-A7	36 x 112	6 1	42322	1
		KEL-FG-A7 with V2A screws	36 x 112	6 1	42322.200	1
		KEL-FG-A7 with threaded bushings M4	36 x 112	6 1	42322.400	1
		KEL-FG-A4	36 x 112	2 2	42324	1
		KEL-FG-A4 with V2A screws	36 x 112	2 2	42324.200	1
		KEL-FG-A4 with threaded bushings M4	36 x 112	2 2	42324.400	1



KEL-FG-A

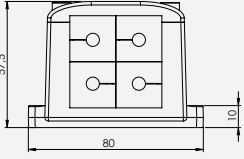
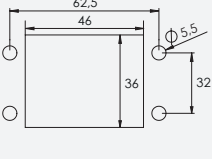
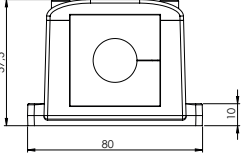
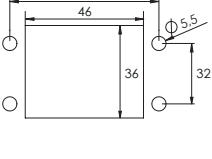
Flange enclosures
for cable entry

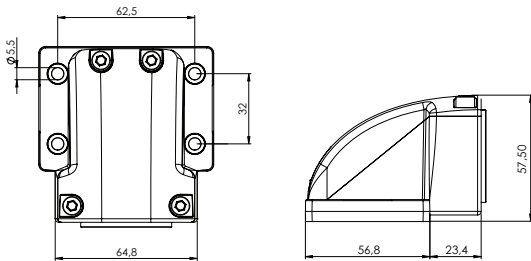
KEL-FG-B

1.11

IP54



Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-B4	46 x 36	4 -	42330	1
		KEL-FG-B4 with V2A screws	46 x 36	4 -	42330.200	1
		KEL-FG-B4 with threaded bushings M4	46 x 36	4 -	42330.400	1
		KEL-FG-B1	46 x 36	- 1	42332	1
		KEL-FG-B1 with V2A screws	46 x 36	- 1	42332.200	1
		KEL-FG-B1 with threaded bushings M4	46 x 36	- 1	42332.400	1



KEL-FG-A

Flange enclosures for cable entry

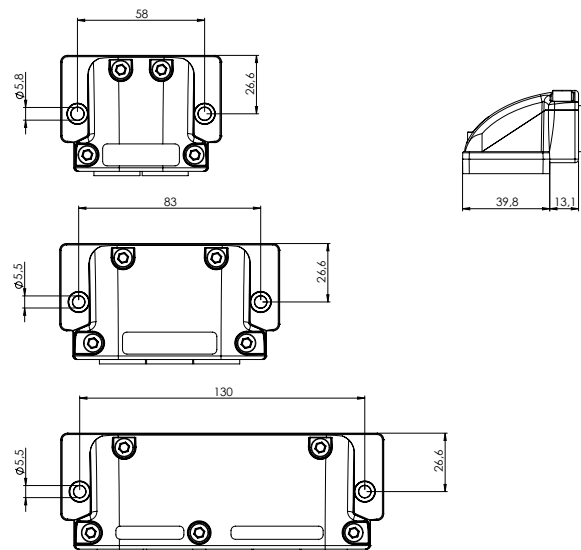
KEL-FG-E

1.11



IP54

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-E2	43 x 24	2 -	42333	5
		KEL-FG-E2 with V2A screws	43 x 24	2 -	42333.200	5
		KEL-FG-E2 with threaded bushings M4	43 x 24	2 -	42333.400	5
		KEL-FG-E3	65 x 24	3 -	42334	5
		KEL-FG-E3 with V2A screws	65 x 24	3 -	42334.200	5
		KEL-FG-E3 with threaded bushings M4	65 x 24	3 -	42334.400	5
		KEL-FG-E5	112 x 24	5 -	42336	5
		KEL-FG-E5 with V2A screws	112 x 24	5 -	42336.200	5
		KEL-FG-E5 with threaded bushings M4	112 x 24	5 -	42336.400	5



Snap-on mounting frames with IP54 rating KEL-SNAP-S, splittable

1.11

Product description

icotek also offers the proven snap-on frame KEL-SNAP as a divisible version KEL-SNAP-S. The snap-in frames enable quick and tool-free assembly of the KEL/KEL-U/KEL-QUICK/KEL-FG-A cable entry systems.

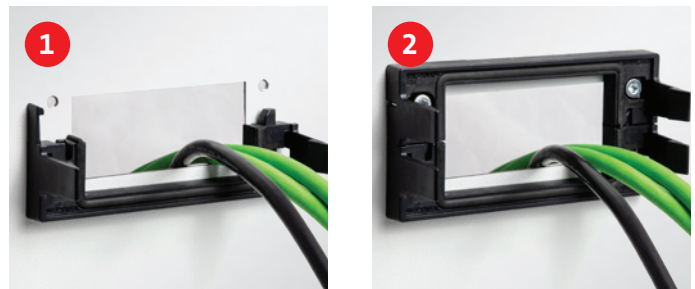
The KEL-SNAP becomes even more versatile with the "S" version. Due to the divisibility of the snap-on frame, it can also be retrofitted without any problems. If an already mounted KEL-SNAP is damaged, it can be replaced by a divisible frame without having to disconnect all the cables that have already been fed through and dismantle the existing KEL.

Advantages

- Subsequent assembly possible
- Upon disassembly (e.g. maintenance) screwing and unscrewing of the cable entry frame is not necessary
- Drilling template identical to cable entry frame
- Integrated gasket
- Previously assembled cable harnesses are quickly and easily attached
- There is no need to thread the cables through the snap-on frame as the divisible frame can be snapped together when the cables have already been passed through the cut-out

Specifications

Material	Polyamide (PA)
IP rating	IP 54
Flame class	UL 94 V-0, self-extinguishing
Temperature	-40°C bis +140°C (static)
Properties	silicone free, halogen free



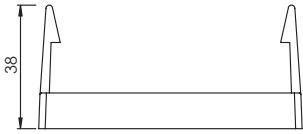
Integrated circular sealing (IP54)

Snap-in locking hook

KEL-SNAP-S

Splittable snap-on mounting frame

1.11



Description	Cut-out Drilling template	Type	Cut-out [mm]	Suitable for	Order No.	PU
		KEL-SNAP-S-B	46 × 38	KEL-B KEL-U-B KEL-QUICK-B	42063	10
		KEL-SNAP-S-10	46 × 65	KEL 10 KEL-U 10 KEL-QUICK 10	42062	10
		KEL-SNAP-S-16	46 × 85	KEL 16 KEL-U 16 KEL-QUICK 16	42061	10
		KEL-SNAP-S-24	46 × 112	KEL 24 KEL-U 24 KEL-FG-A KEL-QUICK 24	42060	10

Snap mounting frames with IP54 rating KEL-SNAP

1.11

Product description

The patented KEL-SNAP frame provides a quick snap-in assembly of the KEL/KEL-U/KEL-QUICK/KEL-FG-A cable entry systems. Control panels, cabinets or machines can be equipped with the KEL-SNAP frame at delivery, allowing a simple push in of the KEL frame when routing cables and conduit. Perfect for enclosures that are maintenance intensive or for an install at a later date.

A cut-out of 46 mm can also be chosen instead of 36 mm. Thus prefabricated multi-pin connectors can be used.

Advantages & benefits

- Upon disassembly (e.g. maintenance) screwing and unscrewing of KEL frame is not necessary
- Previously assembled KEL frames are quickly and easily attached
- Integrated gasket
- Drilling template identical to KEL frame (except KEL-SNAP-B)

Specifications

Material	Polyamide (PA)
Flame class	UL94V-0, self-extinguishing
IP rating	IP54 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free

Accessories

KEL Cable entry frames	16 - 25
KEL-U Cable entry frames	12 - 14
KEL-FG Flange enclosure	30 - 33
KEL-QUICK Cable entry frames	70 - 71
MP Module plates	230 - 231
BPK-SNAP Blank plates	248
ST Plugs	55



Integrated circular sealing (IP54)



Blank plate BPK-SNAP, see page 248



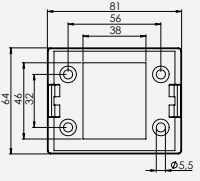
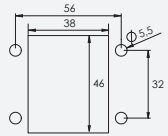
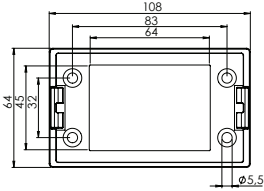
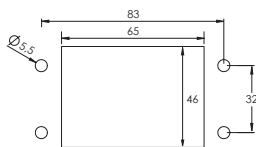
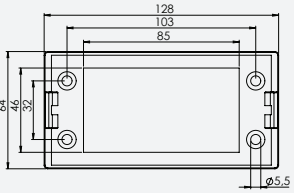
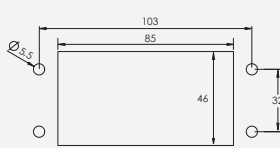
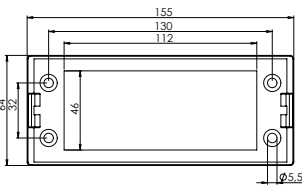
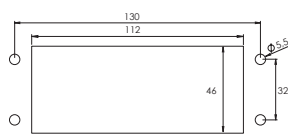
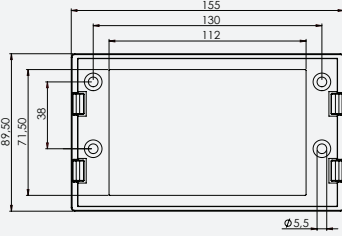
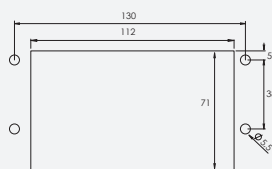
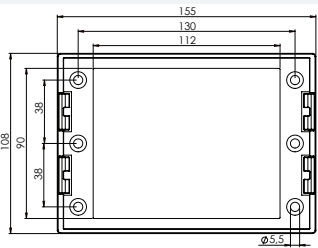
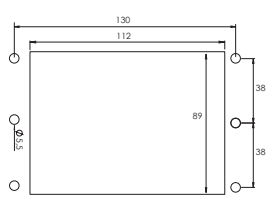
KEL-SNAP

Snap mounting frames



IP54

1.11

Description	Cut-out Drilling template	Type	Cut-out [mm]	Suitable for	Order No.	PU
		KEL-SNAP-B	46 × 38	KEL-B KEL-U-B KEL-QUICK-B	42038	10
		KEL-SNAP 10	46 × 65	KEL 10 KEL-U 10 KEL-QUICK 10	42039	10
		KEL-SNAP 16	46 × 85	KEL 16 KEL-U 16 KEL-QUICK 16	42040	10
		KEL-SNAP 24	46 × 112	KEL 24 KEL-U 24 KEL-FG-A KEL-QUICK 24	42042	10
		KEL-SNAP 24-E	71 × 112	KEL 24-E	42044	1
		KEL-SNAP 24-MT	89 × 112	KEL 24-MT	42046	1

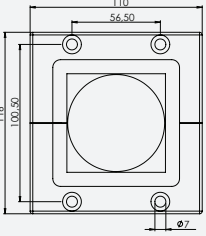
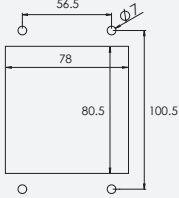
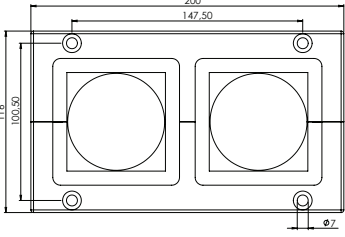
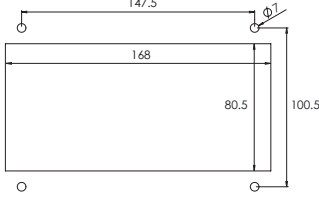
KEL-JUMBO

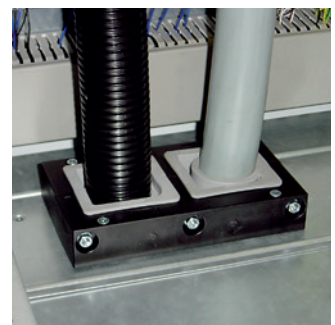
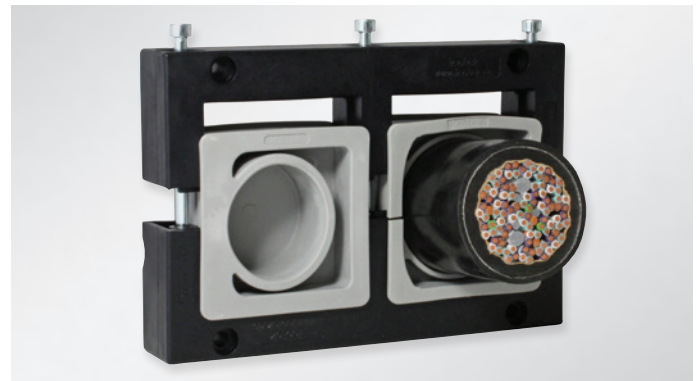
Cable entry frames for supply cables

1.11

IP54



Description	Cut-out Drilling template	Type	Order No.	Dimensions length width height	PU
		KEL-JUMBO 1	42360	110 × 116 × 35 mm	1
		KEL-JUMBO 1 with V2A screws	42360.200	110 × 116 × 35 mm	1
		KEL-JUMBO 2	42350	200 × 116 × 35 mm	1
		KEL-JUMBO 2 with V2A screws	42350.200	200 × 116 × 35 mm	1



Also available with stainless steel screws (V2A).

KTF

Grommets for KEL-JUMBO

1.11



Type	Order No.	Clamping range	PU
KTF 00	42371	Blank grommet	1
KTA	42370	Adapter grommet for KT large	1
KTF 34	42376	33 – 36 mm	1
KTF 38	42379	37 – 40 mm	1
KTF 42	42382	41 – 44 mm	1
KTF 46	42385	45 – 48 mm	1
KTF 50	42388	48 – 52 mm	1
KTF 54	42391	53 – 56 mm	1
KTF 58	42394	56 – 60 mm	1
KTF 62	42397	61 – 65 mm	1

Product description

The KEL-JUMBO cable entry system for installation of cables and conduits with a diameter of up to 65 mm, especially suited for supply cables.

The innovative grommet design with the flex-membrane provides flexing and adjustment of the position for larger and more rigid cables.

We recommend round cut-outs, which can be made using standard punching tools. Suggested cut-out: cable diameter +15–20%. All frame systems come with a rubber gasket.

The grommets KTF are suitable for cable diameters up to 65 mm.

Cables with a comparatively smaller diameter can be utilised with KEL-JUMBO frames by using an adapter grommet.

Advantages & benefits

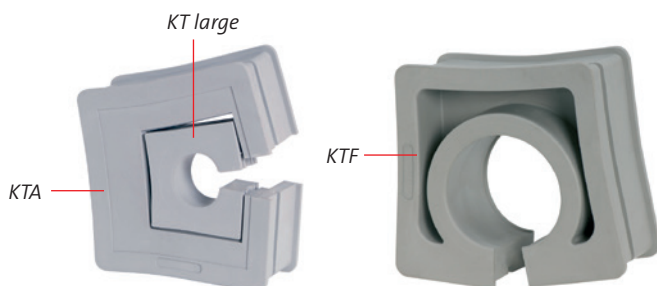
- Installation of cables up to 65 mm
- KTF grommets allow flexing and adjustment of the cable position
- Retrofitting and maintenance can be carried out easily and quickly

Specifications

Material	KEL-JUMBO: Polyamide (PA) KTF: Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	KEL-JUMBO: -40°C to +140°C (static) KTF: -40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimensions	Round, cable diameter +15%
Frame depth	35 mm

Accessories

KDR-ESR Base plates	218 - 227
KDR2 Split base plates	228 - 229
MP Module plates	230 - 231



1.12 Split cable glands for the KT grommet system

1.12



By using icotek's split cable glands, cables with or without connectors or complete cable harnesses with diameters from 1 to 35 mm can be quickly routed into enclosures, cabinets or machines and achieve protection levels up to IP66/IP68/UL type 4X rated.

The split system of the KVT cable glands enables quick and easy assembly which is great for retrofitting and maintenance. The cable is placed into the split grommet which is set into one of the gland halves.

Depending on the size of the cable gland one, two, four or six separate grommets can be installed. The two gland halves can be easily snapped together without the need of tools. The routed lines are securely sealed and held inside the grommets.

To mount the cable gland either snap it into the round metric standard cut-out (sizes available from M20 to M80) or screw it with a hexagonal locknut. The mounting method is dependent on which model is being used.

Screwable or pluggable.

By screwing the top section of the split cable gland to its body, a higher clamping pressure can be achieved (stainless steel screws by default).

Split system

Fast and easy assembly

For metric cut-outs M20 – M80

High cable density, wide variety in cable grommets

Integrated seal

Warranty on pre-terminated cables remains

Special locknuts for e.g. D-Sub or PROFIBUS connectors as well as split locknuts available.

Very good strain relief acc. to DIN EN 62444



KVT-ER 63/4 equipped with 1x pressure compensation element, see page 65.

Chapter content



Split cable glands
M25 – M63,
for cable diameters up to 35 mm

KVT-ER

42 – 43



Split cable glands
M20 – M80,
for cable diameters up to 35 mm

KVT / KVT 80 / KVT-SNAP / KVT-W90

44 – 48



Grommets and plugs
for cables with/without connectors,
cable diameter range 1 – 35 mm

KT small / KT large / KT-DPF / KTMB / KT-SC /
KT-DT / ST / KT ServiceBox

49 – 57



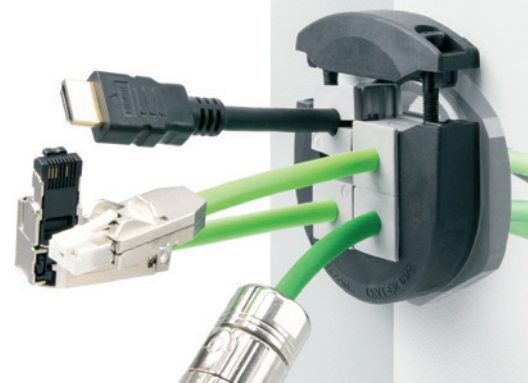
IMAS-CONNECT™
Modular adapter system

AT-FL / AT-PP / AT-KS / AT-K-M / AT-M /
AT-B / PCE / Accessories

58 – 67

Split cable glands with IP66/IP68 rating KVT-ER

1.12



Product description

KVT-ER are split cable glands for routing and sealing cables with and without connectors, conduits or pneumatic hoses with diameters from 1 to 17 mm (KT1 - KT517) and 16 to 35 mm (KT16 - 34).

Because of an integrated gasket, the KVT-ER provides certified protection ratings IP65/IP66/IP67/IP68 when using single position cable grommets.

The KVT-ER sizes are based on metric standard cut-outs M25, M32, M50 and M63. Hexagonal locknuts are included in the shipment.

For assembly, we recommend to tighten the cover lid screws with max. 2 Nm.

Advantages & benefits

- Certified protection class IP65/IP66/IP67/IP68 according to EN 60529 and UL Type 12 & 4X (certified according to UL 50E)
- Very high strain relief according to EN 62444
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done easily and quickly
- High cable density
- Suitable for metric cut-outs
- Hexagonal nut included in the delivery
- V2A stainless steel screws
- Very robust housing, vibration resistant
- Modern design

Specifications

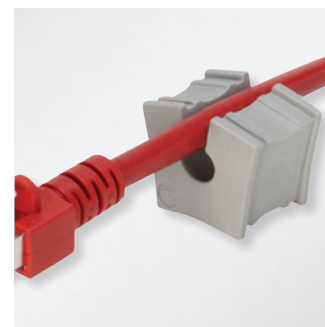
Material	Frame: Polypropylene (PP) Injected gasket: Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP65/IP66/IP67/IP68, if correctly assembled with single grommets (certified acc. to EN 60529)
Temperature	-40°C to +110°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes

Accessories

KT Cable grommets	49 - 54
AT Adapter grommets	60 - 64
KVT-EMC Brackets	189
Locknuts	250
ST Plugs	55 - 56



Certified protection class IP65/
IP66/IP67/IP68



Split KT grommets



With stainless steel screws (V2A).



Injected elastomer gasket

Locknuts

Locknuts with special cut-outs are available separately.



KGM-SUB-D9
fits D-Sub 9 connectors
(Required wall cut-out:
Ø 36 mm, PU: 10)
■ Order No. 45106

KGM-SUB-D25
fits SUB-D25 connectors
(Required wall cut-out:
Ø 50 - 54 mm, PU:10)
■ Order No. 45110

Type GMT: Split locknut, p. 250



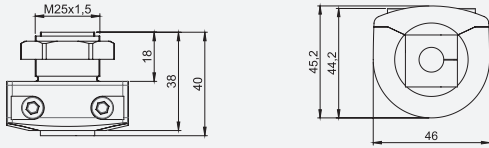
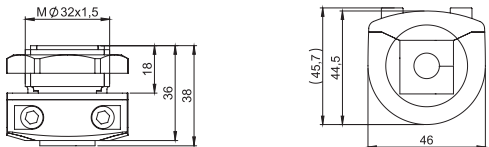
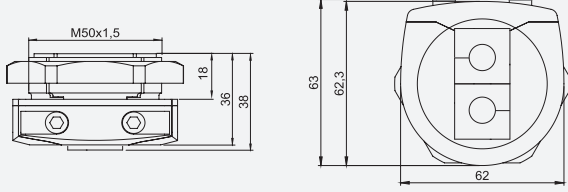
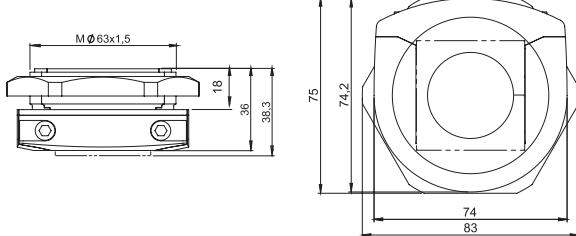
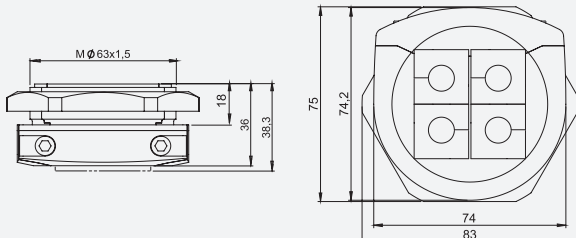
KVT-ER

Split cable glands

1.12



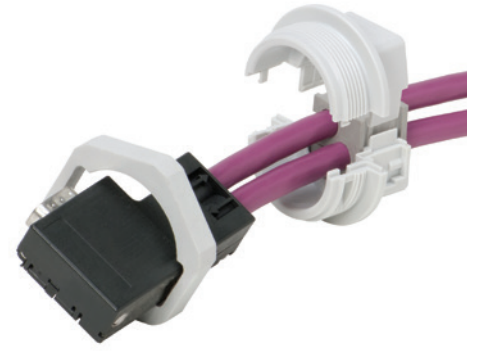
IP66 **IP68**

Description	Type	Order No.	Grommets KT small large	Thread Thread length	PU
	KVT-ER 25*	45450	1 -	M25 × 1.5 Length: 18 mm	10
	KVT-ER 32	45452	1 -	M32 × 1.5 Length: 18 mm	10
	KVT-ER 50 2	45454	2 -	M50 × 1.5 Length: 18 mm	5
	KVT-ER 63 1	45455	- 1	M63 × 1.5 Length: 18 mm	5
	KVT-ER 63 4	45456	4 -	M63 × 1.5 Length: 18 mm	5

* Max. cable diameter of 15 mm

Split cable glands with IP54 rating KVT

1.12



Product description

KVT is a circular split frame for quick and easy installation and sealing of cables with connectors or complete cable harnesses.

Polyamide locknuts as well as a sealing ring are included in the shipment.

For routing D-Sub, DVI or PROFIBUS connectors in combination with the split cable glands KVT, special locknuts with cut-outs are required.

Advantages & benefits

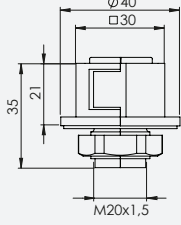
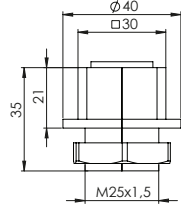
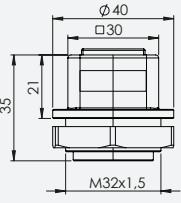
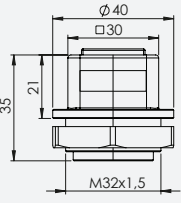
- Insertion of pre-terminated cables
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Suitable for metric cut-outs
- Locknut is included

Specifications

Material	Polycarbonate (PC)
Colour	<ul style="list-style-type: none"> ■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-30°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KVT-EMC Brackets	161
Locknuts	224 - 225
ST Plugs	53

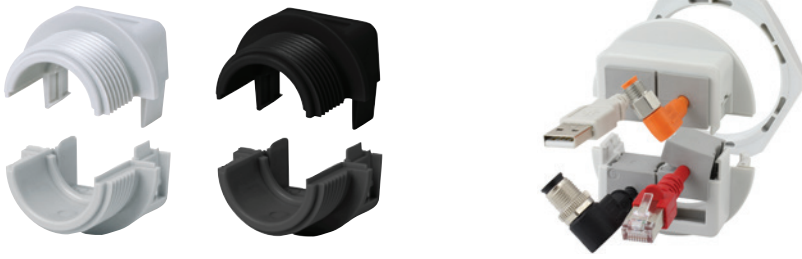
Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT 20**	<ul style="list-style-type: none"> ■ 45034 ■ 45024 	1 -	M20 × 1.5 Length: 14 mm	10
	KVT 25***	<ul style="list-style-type: none"> ■ 45035 ■ 45025 	1 -	M25 × 1.5 Length: 14 mm	10
	KVT 32	<ul style="list-style-type: none"> ■ 45036 ■ 45026 	1 -	M32 × 1.5 Length: 14 mm	10
	KVT 32 + KGM-SUB-D9	<ul style="list-style-type: none"> ■ 45037 ■ 45027 	1 -	M32 × 1.5 Length: 14 mm	10



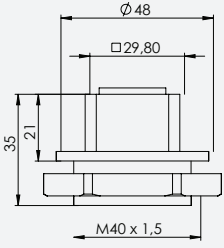
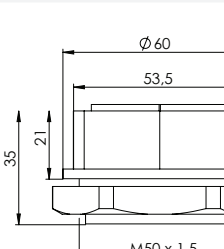
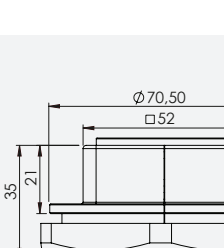
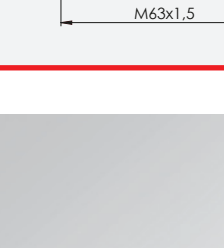

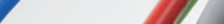
KVT

Split cable glands

1.12



IP54

Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT 40	■ 45203	1 -	M40 × 1.5 Length: 14 mm	10
		■ 45028			
	KVT 40 + KGM-PB	■ 45205	1 -	M40 × 1.5 Length: 14 mm	10
		■ 45029			
	KVT 50 2 *	■ 45204	2 -	M50 × 1.5 Length: 14 mm	5
		■ 45030			
	KVT 50 2 * + KGM-SUB-D25	■ 45206	2 -	M50 × 1.5 Length: 14 mm	5
		■ 45031			
	KVT 63 1	■ 45212	- 1	M63 × 1.5 Length: 14 mm	5
		■ 45112			
	KVT 63 4	■ 45215	4 -	M63 × 1.5 Length: 14 mm	5
		■ 45115			

Locknuts

Locknuts with special cut-outs are available separately. The cut-out dimensions are listed on page 250.



KGM-SUB-D9 fits D-Sub 9 connectors
(Required wall cut-out: Ø 36 mm, PU: 10)
■ Order No. 45105 ■ Order No. 45106

KGM-PB fits DVI and PROFIBUS connectors
(Required wall cut-out: Ø 42 mm, PU: 10)
■ Order No. 45107 ■ Order No. 45109

KGM-SUB-D25 fits SUB-D25 connectors
(Required wall cut-out: Ø 50 - 54 mm, PU:10)
■ Order No. 45108 ■ Order No. 45110



Type GMT: Split locknut, p. 225



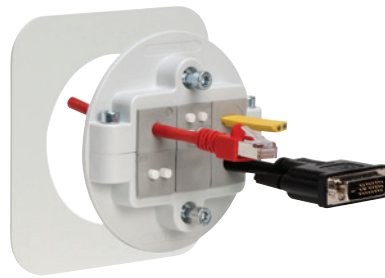
The cable glands enable the integration of the IMAS-CONNECT™ adapter grommets.

* Only valid for grey product types | * cannot be combined with adapter grommet AT-K-M

KVT 80

Split cable glands for front mounting

1.12



Product description

The KVT 80 split cable glands are designed for routing and sealing cables with connectors. By assembling the two frame halves with the screws provided, the grommets provide sufficient pressure on the routed cables to obtain a high degree of strain relief. The KVT 80 can be fitted to a wall thickness from 1.5 mm to 10 mm. A flat rubber gasket is included in the shipment.

Advantages & benefits

- Insertion of pre-terminated cables
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Fast and easy mounting from the front
- Strain relief according to EN 62444

Note

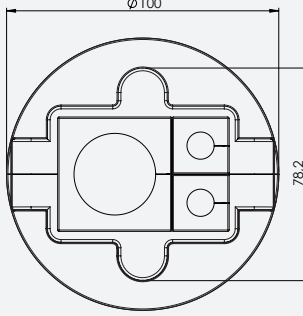
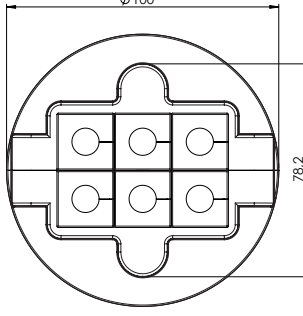
When mounting the KVT 80 on sheet metal, we recommend the following torque values:
 1.5 mm sheet = 1 N m | 2 – 10 mm sheet = 1.5 N m

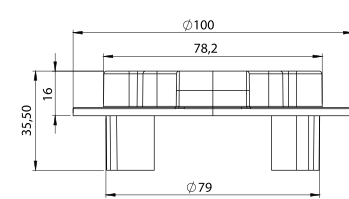
Specifications

Material	Polycarbonate (PC)
Colour	<input type="checkbox"/> grey (similar RAL 7035) <input type="checkbox"/> black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-30°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	80 mm in diameter

Accessories

Cable grommets	49 - 54
ST Plugs	55 - 56

Description	Type	Order No.	Grommets KT small large	PU
	KVT 80 3	<input type="checkbox"/> 45236 <input type="checkbox"/> 45239	2 1	1
	KVT 80 6	<input type="checkbox"/> 45237 <input type="checkbox"/> 45238	6 -	1



*Only valid for grey product types

KVT-SNAP

Split pluggable cable glands

1.12

IP54

Product description

KVT is a circular split frame for quick and easy installation of cables with connectors or complete cable harnesses.

By using the model KVT-SNAP, cables can be routed through thick walls (> 5 mm) e.g. into cast terminal boxes without the use of tools. A sealing ring is included in the shipment.

Assembly

- The snap ring is screwed into metric thread or tapped into the cut-out (it can also be fastened with a locknut, which is included in the shipment of KVT-SNAP 63)
- Once the snap ring is affixed to the housing the equipped KVT is simply pushed into it. Fast and easy installation!

Specifications

Material	Polycarbonate (PC)
Colour	■ grey (similar RAL 7035)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
Temperature	-30°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric cut-outs

Accessories

Cable grommets	49 - 54
KVT-EMC Brackets	189
KGM Locknuts	250
ST Plugs	55 - 56

Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT-SNAP 32	45130	1 -	M32 × 1.5 Length: 11 mm	10
	KVT-SNAP 40	45134	1 -	M40 × 1.5 Length: 11 mm	10
	KVT-SNAP 63 4 + KGM 63	45152	4 -	M63 × 1.5 Length: 11 mm	5
	KVT-SNAP 63 1 + KGM 63	45154	- 1	M63 × 1.5 Length: 11 mm	5
	KGM 32	■ 52275 ■ 52285	PA	M32 × 1.5	10
	KGM 40	■ 52276 ■ 52286	PA	M40 × 1.5	10
	KGM 63	■ 52278 ■ 52288	PA	M63 × 1.5	5



* Only valid for grey product types

KVT-W90

Split cable glands

1.12



Product description

The split KVT-W90 cable glands are used to insert and seal pre-terminated cables and conduits at a 90° angle.

In particular, the KVT 50-W90 is perfectly suited to hold corrugated or smooth hoses. A large number of cable entry grommets is available to the user.

Polyamide standard locknuts as well as a sealing ring are included in the shipment. Split locknuts can be ordered separately.

Advantages & benefits

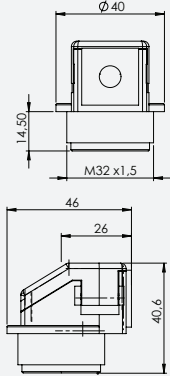
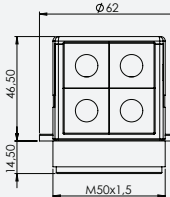
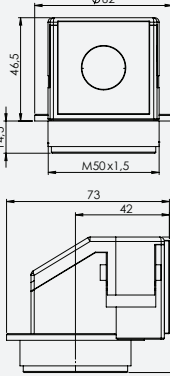
- Installation at an angle of 90° to the cabinet
- Insertion of pre-terminated cables and conduits
- Maintain manufacturer's warranty on pre-terminated cables
- Suitable for metric cut-outs

Specifications

Material	Polycarbonate (PC)
Colour	<input type="checkbox"/> grey (similar RAL 7035) <input type="checkbox"/> black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
Temperature	-30°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric cut-outs

Accessories

Cable grommets	49 - 54
KVT-EMC Brackets	60 - 64
KGM Locknuts	250
ST Plugs	55 - 56

Description	Type	Order No. with locknut	Grommets small large	Thread Thread length	PU
	KVT 32-W90	<input type="checkbox"/> 45404 <input type="checkbox"/> 45406	1 -	M32 × 1.5 Length: 11.5 mm	10
	KVT 50 4-W90	<input type="checkbox"/> 45424 <input type="checkbox"/> 45426	4 -	M50 × 1.5 Length: 11.5 mm	5
	KVT 50 1-W90	<input type="checkbox"/> 45414 <input type="checkbox"/> 45416	- 1	M50 × 1.5 Length: 11.5 mm	5



*Only valid for grey product types

KT ServiceBox

Service box
for cable grommets

1.12



Product description

Convenient – everything available right away!

The KT ServiceBox is perfect for installations and service calls. It ensures your KT grommets are readily available.

Order No. 88001

Content*

Cable grommets, small:

- 110 KT for cables 1 - 17 mm
- 10 BTK blank grommets
- 10 KTMB multi-range grommets
- 2 KT-DPF multi-range grommets
- 8 KT-ASI for ASI-Bus cables
- 1 AT-K-M 12x1.5

Cable grommets, large:

- 25 KT for cables 16 - 35 mm
- 4 BTG blank grommets / ATG adapter grommets
- 3 KTMB multi-range grommets
- 2 KT-DT multi-membrane grommets
- 2 KT-DPF multi-range grommets
- 2 KT-SC
- 2 AT-M 12x1.0

Accessories:

- 1 Cable entry frame KEL-U 10|3
- 1 Cable entry frame KEL-E3
- 1 KVT split cable gland
- 1 KZL strain relief plate

- 1 Cable template

* Subject to alterations

KMS Cable template



The correct size of the KT grommets can easily be determined by using the cable template (material: stainless steel V2A).

- Determining the diameter of the cable using the cable template
- Selecting the KT grommets according to the data on the cable template

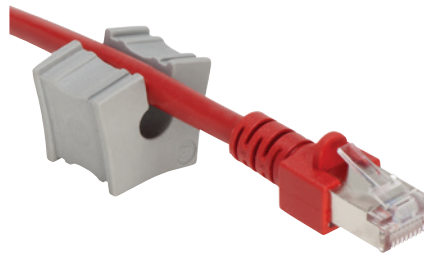
Cable templates can also be ordered separately. **Order-No. 39800**

KT

Grommets, small, single

1.1

IP54 IP66 IP68



Product description

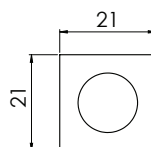
Cable grommets KT small are used with the cable entry frames & cable glands of product groups 1.11, 1.12 and 4.2.

The model range KT small is designed for cable diameters from 1 to 17 mm.

Assembly note

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.

Description	Type	Order No grey	Order No black	Clamping range	PU
	BTK	41251	41351	Blank grommet	10
	KT 1	39941	39943	1 – 2 mm	10
	KT 2	39934	41302	2 – 3 mm	10
	KT 3	41203	41303	3 – 4 mm	10
	KT 4	41204	41304	4 – 5 mm	10
	KT 5	41205	41305	5 – 6 mm	10
	KT 6	41206	41306	6 – 7 mm	10
	KT 7	41207	41307	7 – 8 mm	10
	KT 8	41208	41308	8 – 9 mm	10
	KT 9	41209	41309	9 – 10 mm	10
	KT 10	41210	41310	10 – 11 mm	10
	KT 11	41211	41311	11 – 12 mm	10
	KT 12	41212	41312	12 – 13 mm	10
	KT 13	41213	41313	13 – 14 mm	10
	KT 14	41214	41314	14 – 15 mm	10
	KT 15	41215	41315	15 – 16 mm	10
		KTs 16	39901	39912	16 mm
KTs 17		39900	39913	17 mm	10

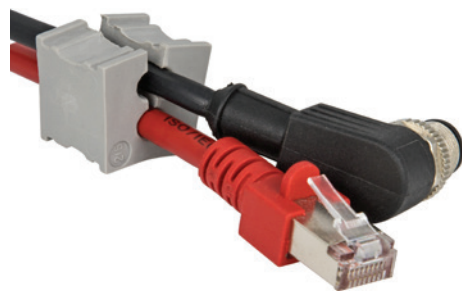




KT

Grommets, small, multi & special grommets

1.1



Description	Type	Order No grey	Order No black	Clamping range	PU
	KT 2 x	KT 2 1	39942 / 39944	2x ø 1 mm	10
	KT 2 2	39935 / 39936	2x ø 2 mm	10	
	KT 2 3	39939 / 39940	2x ø 3 mm	10	
	KT 2 4	39906 / 39907	2x ø 4 mm	10	
	KT 2 5	41200 / 39904	2x ø 5 mm	10	
	KT 2 6	41201 / 39905	2x ø 6 mm	10	
	KT 2 7	41202 / 39916	2x ø 7 mm	10	
	KT 2 8	39917 / 39918	2x ø 8 mm	10	
	KT 4 x	KT 4 2	39937 / 39938	4x ø 2 mm	10
	KT 4 3	39914 / 39915	4x ø 3 mm	10	
	KT 4 4	39909 / 39911	4x ø 4 mm	10	
	KT 4 5	39908 / 39910	4x ø 5 mm	10	
	KT 4 6	39932 / 39933	4x ø 6 mm	10	
		KT ASI	KT-ASI	39902 / 39903	1 ASI-cable
KT-ASI2 rl		39922 / 39924	2 ASI-cables	10	
	KT-ASI2 l	39921 / 39923	2 ASI-cables	10	
	KT oval	KT oval	39930	approx. 8 x 4 mm	10
	KT S1	KT S1	39931		10
	KT tele	KT tele	39929	Telephone cable	10
	KT tele1	KT tele1	41257	Data cable RJ12	10
	KT tele2	KT tele2	41258	Data cable RJ10 / RJ45	10

Specifications KT grey

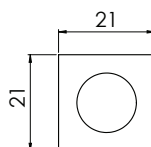
Material: Elastomer
 Flame class: UL 94 V-0, self-extinguishing
 IP rating: KT round, single: up to IP66/IP68
 KT round, multi: IP54
 KT special, multi: IP54
 UL type rating: up to UL type 4X (acc. to UL 50E)
 Temperature: - 40°C to + 100°C (static)
 Properties: Halogen-free, silicone-free

Specifications KT black

Material: Elastomer
 Flame class: UL 94 HB
 IP rating: KT round, single: up to IP66/IP68
 KT round, multi: IP54
 KT special, multi: IP54
 Temperature: - 30°C to + 90°C (static)
 Properties: Silicone-free
 Higher chemical resistance
 e.g. with aggressive oils, coolants

Accessories

ST Plugs 55 - 56

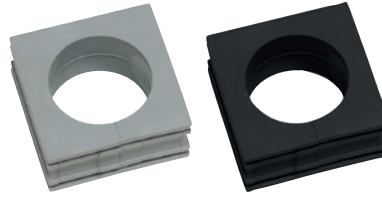


*Only valid for grey product types

KT

Grommets, large

1.1



Product description

Cable grommets KT large accept a wide range of cable diameters from 16 to 35 mm. They are used with the cable entry frames and cable glands of product groups 1.11, 1.12 and 4.2.

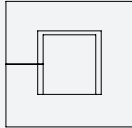

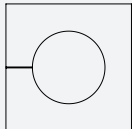
ATG adapter grommets provide the possibility to hold a small KT grommet to reduce the clamping range down to 1 mm.

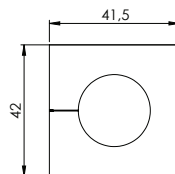
Specifications KT grey

Material Elastomer
Flame class UL 94 V-0, self-extinguishing
IP rating KT round, single: up to IP66/IP68
 ATG/BTG: IP54
UL type rating up to UL type 4X (acc. to UL 50E)
Temperature -40°C to +100°C (static)
Properties Halogen-free, silicone-free

Specifications KT black

Material Elastomer
Flame class UL94-HB
IP rating KT round, single: up to IP66/IP68
 ATG/BTG: IP54
Temperature -30°C to +90°C (static)
Properties Silicone-free
 Higher chemical resistance
 e.g. with aggressive oils, coolants

Description	Type	Order No. grey	Order No. black	Clamping range	PU
 ATG	ATG	41253	41353	Adapter grommet	10
 BTG	BTG	41252	41352	Blank grommet	10
 KT round	KT 16	41216	41316	16 - 17 mm	10
	KT 17	41217	41317	17 - 18 mm	10
	KT 18	41218	41318	18 - 19 mm	10
	KT 19	41219	41319	19 - 20 mm	10
	KT 20	41220	41320	20 - 21 mm	10
	KT 21	41221	41321	21 - 22 mm	10
	KT 22	41222	41322	22 - 23 mm	10
	KT 23	41223	41323	23 - 24 mm	10
	KT 24	41224	41324	24 - 25 mm	10
	KT 25	41225	41325	25 - 26 mm	10
	KT 26	41226	41326	26 - 27 mm	10
	KT 27	41227	41327	27 - 28 mm	10
	KT 28	41228	41328	28 - 29 mm	10
	KT 29	41229	41329	29 - 30 mm	10
	KT 30	41230	41330	30 - 31 mm	10
	KT 31	41231	41331	31 - 32 mm	10
	KT 32	41232	41332	32 - 33 mm	10
	KT 33	41233	41333	33 - 34 mm	10
	KT 34	41234	41334	34 - 35 mm	10



KT / KT-DPF large

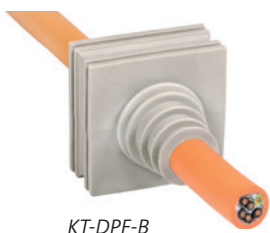




KT-DPF | KT-SC | KTMB

Grommets, multi-range

1.1



KT-DPF-B



KT-SC



Product description

The KT-DPF /KTMB grommets accept a wide range of cable diameters. This is a great benefit when the exact cable diameter is not known in advance. The KT-DPF /KTMB grommets are not split and therefore only usable for cables without connectors. Cutting of KT-DPF grommets: Cable diameter less 20%.

The KT-SC grommet is based on the large KT grommet and enables flexible routing and sealing of electrical cables and pneumatic hoses with diameters from 5 – 28 mm.

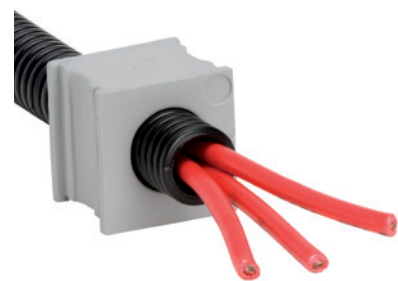
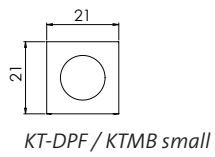
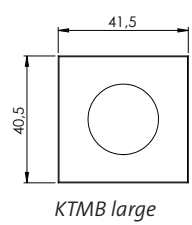
Specifications grey

Material	Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free

Specifications black

Material	Elastomer
Flame class	UL94-HB
IP rating	IP54
Temperature	-30°C to +90°C (static)
Properties	Silicone-free Higher chemical resistance e.g. with aggressive oils, coolants

Description	Type	Order No.	Size KT	Clamping range	PU
 KT-DPF-A	KT-DPF-A	41260 (grey) 41360 (black)	KT small	3 - 12 mm	10
 KT-DPF-B	KT-DPF-B	41261 (grey) 41361 (black)	KT large	4 - 18 mm	10
 KT-DPF-C	KT-DPF-C	41262 (grey) 41362 (black)	KT large	14 - 26 mm	10
 KT-SC	KT-SC	41485	KT large	5 - 28 mm	10
 KTMB-D	KTMB-A	41432	KT small	2.5 - 6.5 mm	10
 Cross section KTMB	KTMB-B	41434	KT small	4 - 7.5 mm	10
	KTMB-C	41436	KT small	6.5 - 10 mm	10
	KTMB-D	41438	KT small	9.5 - 13 mm	10
	KTMB-E	41440	KT small	13 - 16 mm	10
 KTMB-G	KTMB-G	41460	KT large	13 - 18 mm	10
 KTMB-H	KTMB-H	41465	KT large	18 - 23 mm	10
 KTMB-I	KTMB-I	41470	KT large	23 - 28 mm	10
	KTMB-J	41475	KT large	28 - 33 mm	10
 KTMB-K	KTMB-K	41480	KT large	2x 13 - 18 mm	10



KMS Cable template

Page 49
Order No. 39800



*Only valid for grey product types

KT-DT

Membrane cable grommets

1.1

IP54



Product description

The KT-DT cable grommets are designed for cables without preassembled connectors. A large number of cables can be routed utilising minimal space.

KT-DT 1 – KT-DT 5 grommets are designed to fit in KT large grommet spaces. KT-DT7 & KT-DT 8 grommets are designed to fit in KT small grommet spaces.

The KT-DT grommets are also perfectly suitable for the assembly of subsequently terminated cable harnesses.

Advantages & benefits

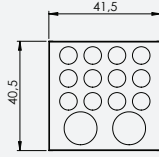
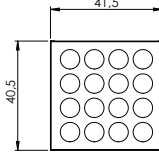
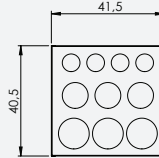
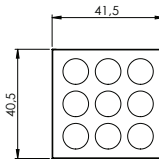
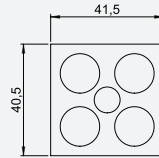


- Combination of routing pre-terminated cables and cables without connectors with one cable entry frame
- Enables sub-assembly of cable harnesses
- High cable density

Specifications

Material	Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Accessories

ST-B Plugs 123

Description	Type	Order No.	Number of cables	PU
	KT-DT 1	41500	12× max. 6.5 mm 2× max. 12.2 mm	10
	KT-DT 2	41510	16× max. 7.1 mm	10
	KT-DT 3	41520	4× max. 6.5 mm 3× max. 9.5 mm 3× max. 11.3 mm	10
	KT-DT 4	41530	9× max. 9.5 mm	10
	KT-DT 5	41540	4× max. 14.5 mm 1× max. 9.5 mm	10
	KT-DT 7	41550	4× max. 6 mm	10
	KT-DT 8	41552	2× max. 7 mm 2× max. 4 mm	10

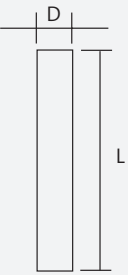


ST

Plugs for cable grommets

1.1



Description	Type	Order No.	Diameter D	Length L	PU
	ST 1	42900	1 mm	25 mm	25
	ST 2	42909	2 mm	25 mm	25
	ST 3	42901	3 mm	25 mm	25
	ST 4	42908	4 mm	25 mm	25
	ST 5	42906	5 mm	25 mm	25
	ST 6	42903	6 mm	25 mm	25
	ST 7	42905	7 mm	25 mm	25
	ST 8	42899	8 mm	20 mm	25
	ST 9	42897	9 mm	20 mm	25
	ST 10	42895	10 mm	20 mm	25
	ST 11	42893	11 mm	20 mm	25
	ST 12	42891	12 mm	20 mm	25
	ST 13	42889	13 mm	20 mm	25
	ST 14	42887	14 mm	20 mm	25
	ST 15	42885	15 mm	20 mm	25
	ST 16	42883	16 mm	20 mm	25
	ST 17	42881	17 mm	20 mm	25
ST ASI	42877	-	25 mm	25	

Product description

Plugs are used to close either KT or QT grommets which are not equipped with cables. IP ratings of the grommets remain.

Perfect for applications where cables have been removed or might be routed at a later stage.

Advantages & benefits

- Sealing unused cable grommets

Specifications

Material	Polyamide (PA), white
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP rating of grommets remains
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +120°C
Properties	Halogen-free, silicone-free

Compatible with

KT Cable grommets	49 - 54
QT Cable grommets	80



Cover plugs for cable entry frames

1.1



Product description

The openings at the fastening points of the cable entry frames can be closed with the cover plugs.

There are two versions: One version to cover the openings when using threaded bushings, one to cover the screws. The cover plugs can be used with the products of the KEL series.

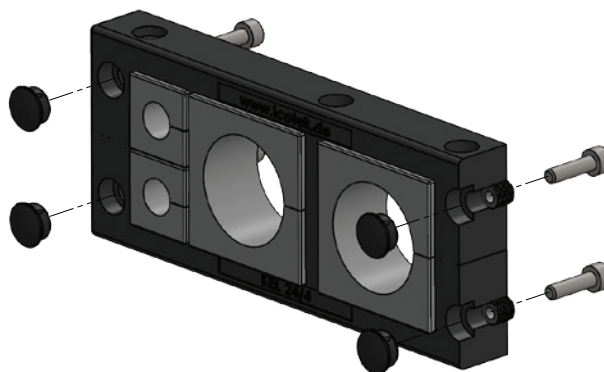
Advantages

- Simple closing of the openings at the fastening points of the KEL
- Smooth finish on the frame surface
- No dirt recesses

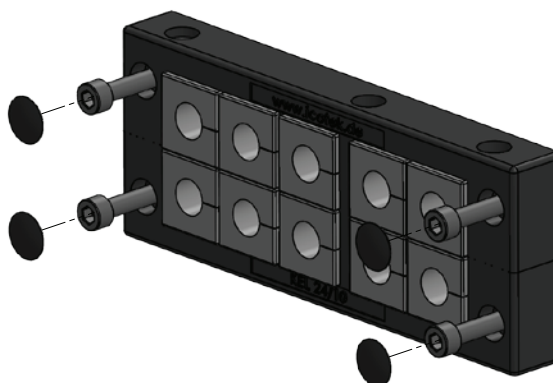
Specifications

Material	PE (Polyethylen)
Temperature	Continuous operating temperature +70°C
Properties	Higher chemical resistance

Description	Order No.	PU
Cover plugs A black for threaded bushings, for KEL	■ 99142	100
Cover plugs B black for M5 DIN 912 Screws, for KEL	■ 99200	40



When fastening from the rear using a threaded bushing, an opening is created at the front at the fastening points. These can be closed with the **cover plugs A** in black (Order No. 99142).



When fastening from the front by means of screws, the openings at the screw heads can be closed with the **cover plugs B** in black (order no. 99200). The cover plugs can only be used for M5 DIN 912 screws.

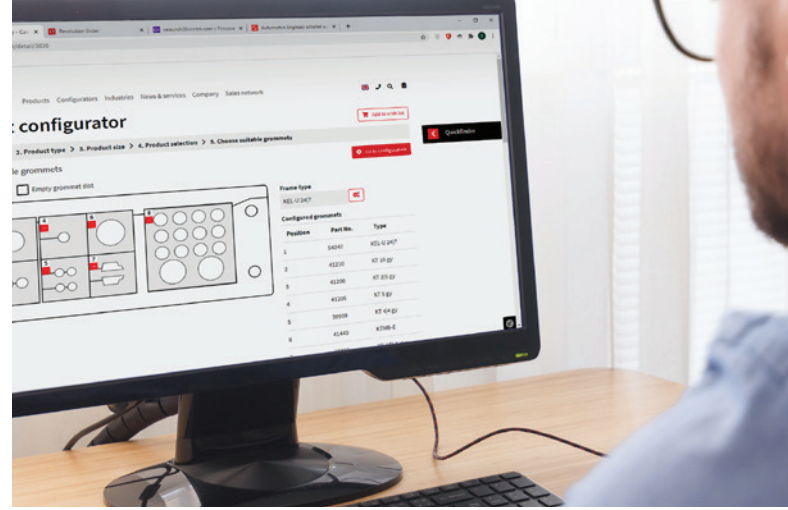




The practical product configurator

With the product configurator, you can now assemble your cable entry system with the required cable or adapter grommets.

Check it out: www.icotek.com/en/config




Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

1. Choose product group


Cable entry frames for cables with connectors



Using the patented grommet based Icotek KEL cable entry system, pre-terminated as well as standard cables without connectors can be routed into switch cabinets, control panels or machines. The cables are also sealed (up to IP66 / UL type 4x) and strain relieved.

Select


Cable glands for cables with connectors



By using split cable glands by Icotek pre-terminated cables with diameters from 1 to 35 mm can be quickly routed into enclosures, control panels or machines and be sealed with up to IP66 / IP68 / UL type 4x rated ingress protection (certified according to EN 60529 / UL50-E). In addition, the cable glands serve as strain reliefs on the cable. The split cable glands enable quick and easy assembly which is great for retrofits and maintenance.

Select

EMC cable entry systems



In case of conducted as well as field bound EMI disturbances, our split EMC cable entry systems offers an effective way to divert and block those disturbances and provides an economic alternative to expensive EMC cable glands.

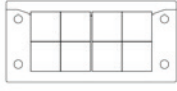
Select

Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

4. Choose product type


KEL-U 16|8



Mounting options: Snap-in with KEL-SNAP
Screw type mounting
Classification: IP54, UL Type 12
Max. cable diameter: 17 mm
Length: 120 mm
Width: 58 mm
Height: 17 mm
Max. cut-out width: 36 mm
Max. cut-out length: 86 mm

Select


KEL-U 16|8 V2A



Mounting options: Snap-in with KEL-SNAP
Screw type mounting
Classification: IP54, UL Type 12
Max. cable diameter: 17 mm
Length: 120 mm
Width: 58 mm
Height: 17 mm
Max. cut-out width: 36 mm
Max. cut-out length: 86 mm

Select

KEL-U 16|5



Mounting options: Snap-in with KEL-SNAP
Screw type mounting
Classification: IP54, UL Type 12
Max. cable diameter: 35 mm
Length: 120 mm
Width: 58 mm
Height: 17 mm
Max. cut-out width: 36 mm
Max. cut-out length: 86 mm

Select

Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

5. Choose suitable grommets

Part No.	Type	Max. cable diameter	Max. cut-out width	Max. cut-out length
KT 7 gy	KT small	7 - 8 mm	36 mm	86 mm
KT 8 gy	KT small	8 - 9 mm	36 mm	86 mm
KT 9 gy	KT small	9 - 10 mm	36 mm	86 mm
KT oval gy	KT small	-	36 mm	86 mm
KT tele gy	KT small	-	36 mm	86 mm

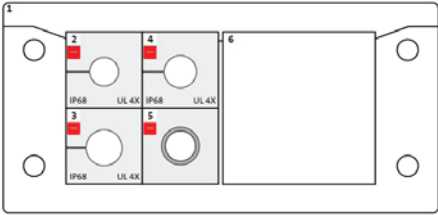
Select

Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

5. Choose suitable grommets

1



2

3

4

5

6

Frame type
KEL-U 16|5

Configured grommets

Position	Part No.	Type
1	54165	KEL-U 16 5
2	41208	KT 8 gy
3	41210	KT 10 gy
4	41209	KT 9 gy
5	39956	AT-K-M M12 x 1.5

Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

5. Choose suitable grommets

Part No.	Type	Max. cable diameter	Max. cut-out width	Max. cut-out length
AT-KS	IMAS-CONNECT Adaptertülle groß	-	36 mm	86 mm
AT-M 12 x 1.0	M12 x 1.0 IMAS-CONNECT Adaptertülle groß	-	36 mm	86 mm
AT-M 16 x 1.5	M16 x 1.5 IMAS-CONNECT Adaptertülle groß	-	36 mm	86 mm
AT-M 20 x 1.5	M20 x 1.5 IMAS-CONNECT Adaptertülle groß	-	36 mm	86 mm
AT-M 25 x 1.5	M25 x 1.5 IMAS-CONNECT Adaptertülle groß	-	36 mm	86 mm

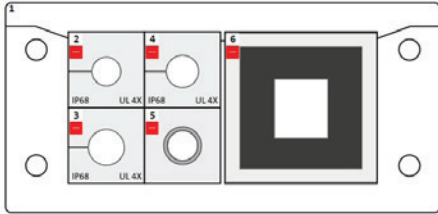
Select

Product configurator

1. Product group > 2. Product type > 3. Product size > 4. Product variant > 5. Choose suitable grommets

5. Choose suitable grommets

1



2

3

4

5

6

Frame type
KEL-U 16|5

Configured grommets

Position	Part No.	Type
1	54165	KEL-U 16 5
2	41208	KT 8 gy
3	41210	KT 10 gy
4	41209	KT 9 gy
5	39956	AT-K-M M12 x 1.5
6	39952	AT-KS

1.13 Modular adapter system IMAS-CONNECT™ for the KT system

1.13



The IMAS-CONNECT™ adapter system by icotek is a modular designed grommet system for mounting metric connectors, PushPull modules, Keystone couplers, hose fittings, pressure compensation elements and much more.

By utilising the modular adapter system, the cable entry frame becomes a hybrid system. Pre-terminated and standard cables or hoses can be routed and at the same time the system serves as an interface for connectors.

The grommets, made of elastomer with a polyamide body, fit perfectly into the icotek cable entry frames e.g. KEL-U, KEL-ER, KEL-FG and meet the protection classes IP54 to IP66.

NEW

New: Adapter grommet for M23 square flange (AT-FL)

Available with threaded insert (AT-K-M/AT-K-Z), based on the KT cable grommet.

Available with pre-terminated cut-out for PushPull systems (AT-PP)

Available with metric inner threads of M12 x 1.0, M16 x 1.5, M20 x 1.5, M25 x 1.5 (AT-M).

Perfect integration into the split icotek cable entry frames.

Usable area for special cut-outs and drill-holes: 24 x 24 mm; Wall thickness: 6 mm (AT-B)

At a high cable density only one cut-out is necessary.

Elastomer grommet with polyamide body based on the grommet KT large.

High protection class: up to IP66

Available with pre-terminated cut-out for Keystone couplers (AT-KS).

Chapter content



Adapter grommet
for M23 square flange **NEW**
AT-FL **60**



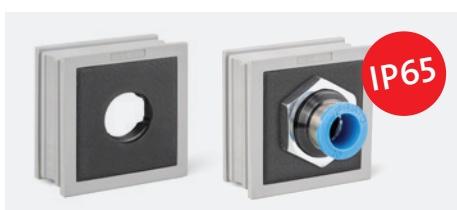
Adapter grommet
for PushPull connector systems
AT-PP **61**



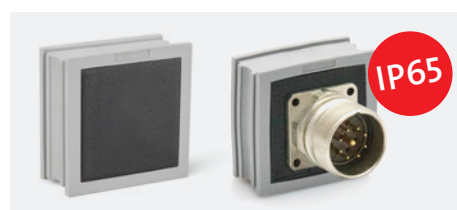
Adapter grommet
for Keystone couplers
AT-KS **62**



Adapter grommet, small
with threaded insert
AT-K-M | AT-K-Z **63**



Adapter grommet
with metric inner thread
AT-M **64**



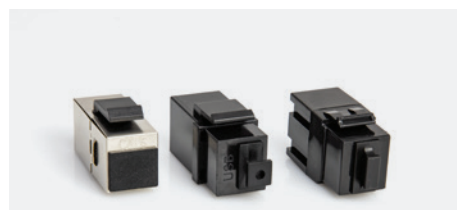
Adapter grommet, blank
AT-B **64**



Pressure compensation element
with metric thread
PCE **65**



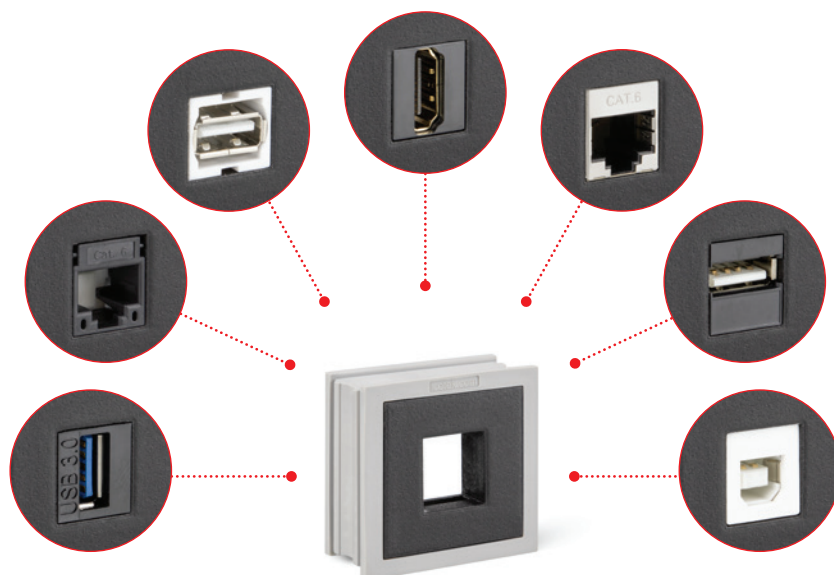
Adapter grommet
with mounted Keystone modules
or bulkhead couplings **NEW**
66



Keystone modules, bulkhead couplings and accessories **NEW**
67

Various application examples

USB, RJ45, HDMI and approx. 70 other Keystone couplers.

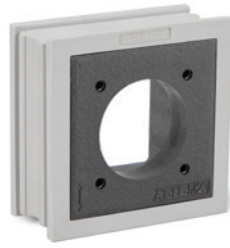


AT-FL

Adapter grommet for M23 square flange

1.13

IP65



Product description

The grommet AT-FL is constructed on the basis of a large KT cable grommet. The polyamide body is moulded with elastomer. All square flanges with dimensions 19.8 x 19.8 mm (M23) can be integrated.

The insertion of AT-FL into an icotek cable entry frame enables the routing of cables with and without connectors in combination with the creation of interfaces for M23 connectors within one cable entry system. Separate cut-outs for connectors are no longer necessary.

AT-FL provides ingress protection of up to IP65 (depending on the used flange and connector).

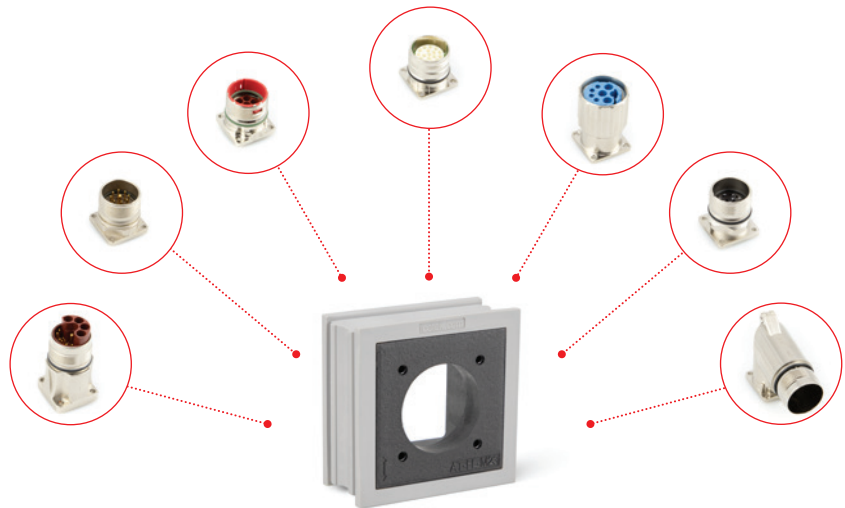
Advantages & benefits

- By using the AT-FL grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Cost-saving assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54, IP55, IP64, IP65
Temperature	-40°C to +90°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Material	PU
AT-FL	39965	42 x 41.5 x 19	PA/Elastomer	5



AT-PP

Adapter grommet
for PushPull connector systems

1.13



IP65

Type	Order No.	Height x width x length [mm]	Material	PU
AT-PP	39961	42 x 41.5 x 19	PA/Elastomer	5

Product description

The grommet AT-PP is constructed on the basis of a large KT cable grommet. In this elastomer grommet, a polyamide body is integrated. All modules based on the PushPull system can be inserted into the grommet.

By using the grommet AT-PP, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

PushPull modules and add-on housings are not included in the scope of delivery.

Advantages & benefits

- By using AT-PP grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Time saving solution
- Space-saving solution
- Assembly costs are reduced

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



The module (left) snaps into the rear of the add-on housing mounted on the AT-PP.



AT-KS

Adapter grommet for Keystone couplers

1.13



Product description

The grommet AT-KS is constructed on the basis of a KT cable grommet. In this elastomer grommet, a polyamide body is integrated. All couplers based on the Keystone system can be simply snapped in.

By using the grommet AT-KS, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

Advantages & benefits

- By utilising the AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Grommet is suitable for all Keystone couplers
- Snap-in assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Individual Keystone modules on page 67.

Type	Order No.	Height x Width x Length [mm]	Material	PU
AT-KS	39952	42 x 41.5 x 19	PA/Elastomer	10

Type	Order No.	Height x Width x Length [mm]	Colour Keystone module	PU
AT-KS-USB 3.0	39968	42 x 41.5 x 19	black	1
AT-KS-HDMI	39969	42 x 41.5 x 19	black	1
AT-KS-CAT6	39970	42 x 41.5 x 19	silver	1



USB-, RJ45 or e.g. HDMI connectors can be plugged in from the front and from the back.



AT-K-M | AT-K-Z

Adapter grommet, small
with threaded insert

1.13



IP66

Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
AT-K-M 5x0.5	39953	21 x 21 x 19	M5 x 0.5	Brass/Elastomer	5
AT-K-M 8x0.5	39966	21 x 21 x 19	M8 x 0.5	Brass/Elastomer	5 NEW
AT-K-M 8x1.0	39954	21 x 21 x 19	M8 x 1.0	Brass/Elastomer	5
AT-K-M 12x1.0	39955	21 x 21 x 19	M12 x 1.0	Brass/Elastomer	5
AT-K-M 12x1.5	39956	21 x 21 x 19	M12 x 1.5	Brass/Elastomer	5
AT-K-M 14x1.0	39962	21 x 21 x 19	M14 x 1.0	Brass/Elastomer	5
AT-K-M 16x1.5	39957	21 x 21 x 19	M16 x 1.5	Brass/Elastomer	5
AT-K-Z 1/8"	39963	21 x 21 x 19	1/8"	Brass/Elastomer	5
AT-K-Z 1/4"	39964	21 x 21 x 19	1/4"	Brass/Elastomer	5

KEL-U 183-E16 mounted with
16x AT-K-M 12x1.5, equipped
with 16x pneumatic Schott
plug-in connector



Product description

The AT-K-M grommet is constructed on the basis of a KT cable grommet. The grommets are made of elastomer with a nickel-plated brass body. The AT-K-M grommets are available with inner threads in sizes M5 x 0.5, M8 x 0.5, M8 x 1.0, M12 x 1.0, M12 x 1.5, M14 x 1.0 and M16 x 1.5 and the AT-K-Z grommets with inner threads in sizes 1/8" and 1/4".

By using the AT-K-M adapter grommet, several connectors can be inserted directly into the cable entry frame, e.g. pneumatic bulkhead connectors M12 x 1.0 and M14 x 1.0, metric connectors and pressure compensation elements.

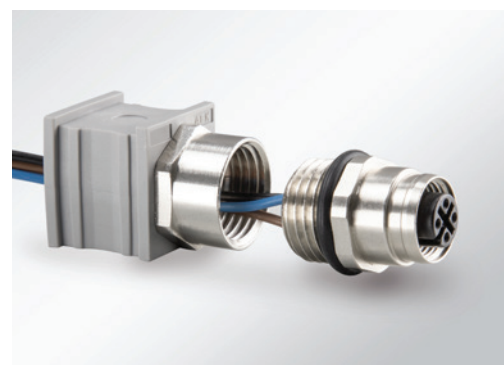
They are compatible with all split icotek cable entry systems that are suitable for KT cable grommets.

Advantages & benefits

- By using AT-K-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M5 to M16 and 1/8" to 1/4" available

Specifications

Material	Grommet: Elastomer Body: nickel-plated brass
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP66 when using correct components
Temperature	-40°C bis +100°C (static)
Properties	Halogen free, silicone free



AT-K-M with extension M16x1,5 for M12 built-in connectors

AT-M | AT-B

Adapter grommet with metric inner thread

1.13



Product description

AT-M is a grommet (based on large KT grommets) with integrated metric threads, suitable for split icotek cable entry systems. The AT-M grommets are made of elastomer with a polyamide body. AT-M grommets are available with inner threads in sizes M12x1.0, M16x1.5, M20x1.5 and M25x1.5.

The AT-M is ideal for creating an interface for signal, data, power and hybrid connectors by simply screwing them into the AT-M thread. Pressure compensation elements or conduit connectors up to M25x1.5 can also be screwed into the AT-M.

icotek also offers screw plugs for sizes M16, M20 and M25 to close the new adapter grommet with the metric internal thread AT-M.

There is also a blank AT-B grommet available. The integrated polyamide body is completely closed on one side. The effective area is 24 x 24 mm, the wall thickness is 6 mm. Custom drill-holes and cut-outs can be made here for e.g. installation of screw mounted hybrid connectors.

Advantages & benefits

- By using AT-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M12 to M25 available
- Blank grommet for flexible use

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL94-Vo, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Thread	Material	PU
AT-M 12x1.0	39946	42 x 41.5 x 19	M12 x 1.0	PA/Elastomer	10
AT-M 16x1.5	39947	42 x 41.5 x 19	M16 x 1.5	PA/Elastomer	10
AT-M 20x1.5	39948	42 x 41.5 x 19	M20 x 1.5	PA/Elastomer	10
AT-M 25x1.5	39949	42 x 41.5 x 19	M25 x 1.5	PA/Elastomer	10
AT-B blank	39950	42 x 41.5 x 19	–	PA/Elastomer	10



KEL-U 24/7 mounted with 1x AT-M, equipped with 1 connector M12x1.0, for the connection of sensors.



KEL 24/21-2 MT mounted with 3x AT-M, equipped with M16 circular connector, M12 pressure compensation element and a hybrid connector.

Screw plugs for AT-M

Type	Order No.	Thread	Material	PU
Screw plug M16 x 1.5	99195	M16	Polyamide	10
Screw plug M20 x 1.5	99196	M20	Polyamide	10
Screw plug M25 x 1.5	99197	M25	Polyamide	10



PCE M12 x 1.5

Pressure compensation element
with metric thread

1.13



IP68

Product description

The pressure compensation element PCE with M12 x 1.5 thread is used to avoid variations in pressure caused by differences in temperature and thus to prevent damage caused by condensation. It provides protection class IP68. The pressure compensation element is easy to install by screwing it directly into the enclosure wall or via icotek adapter grommets AT-K-M 12x1.5.

Type	Order No.	Thread	PU
PCE M12 x 1.5	99190	M12 x 1.5	10



KEL 24|21-2 MT equipped with M12 pressure compensation element



KVT-ER 63/4 equipped with pressure compensation element

Adapter grommet

with mounted Keystone modules or bulkhead couplings

1.13



Product description

The adapter grommets type AT-KS are also supplied with pre-assembled keystone modules, type AT-K-M with bulkhead couplings.

Advantages

- By utilising the AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Keystone modules or bulkhead couplings are already pre-assembled

Specifications

Material	Grommet: Elastomer Body: Polyamide Bulkhead coupling: Brass nickel plated
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature Properties	-40°C to +100°C (static) Halogen free, silicone free

Type	Order No.	Height x Width x Length [mm]	Colour Keystone module	PU
AT-KS-USB 3.0	39968	42 x 41.5 x 19	black	1

AT-KS-HDMI	39969	42 x 41.5 x 19	black	1
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AT-KS-CAT6	39970	42 x 41.5 x 19	silver	1
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Type	Order No.	Height x Width x Length [mm]	suitable for pneumatic hose	PU
AT-K-M 12x1,0 with bulkhead coupling	39971	42 x 41.5 x 19	4 mm	1

AT-K-M 14x1,0 with bulkhead coupling	39972	42 x 41.5 x 19	6 mm	1
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Keystone modules, bulkhead couplings and accessories

1.13



Keystone modules

Type	Order No.	Colour	PU
Keystone module USB 3.0	99204	black	5
Keystone module HDMI	99205	black	5
Keystone module CAT 6	99206	silver	5

Bulkhead couplings

Type	Order No.	suitable for pneumatic hose	Thread	PU
Bulkhead coupling	99210	4 mm	M12 x 1,0	10
Bulkhead coupling	99211	6 mm	M12 x 1,0	10

Dust caps

Type	Order No.	suitable for	PU
Dust caps for HDMI	99207	HDMI connectors	5
Dust caps for USB	99208	USB connectors	5
Dust caps for RJ-45	99209	RJ-45 connectors	5

Product description

The Keystone modules and bulkhead couplings are also available individually for use with the adapter grommets.

Advantages

- By utilising the adapter grommets, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Snap-in assembly

Specifications

Material	Bulkhead coupling: Brass nickel plated
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on module type and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



1.21 Split cable entry frames for the QT grommet system



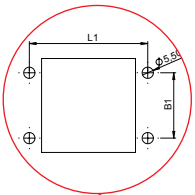
1.21

With the new version of the compact, split cable entry system KEL-QUICK icotek released a highly efficient and cost-effective possibility for pass-through and IP54 sealing of cables with or without connectors, conduits and pneumatic hoses.

The cable entry system KEL-QUICK is an outstanding alternative to cable glands. Especially for applications that do not necessarily require standard-compliant strain relief acc. to EN 62444, the KEL-QUICK is the perfect solution.

Split cable grommets of the QT series are used for routing lines with diameters of 1 – 29 mm within the KEL-QUICK. In addition, there are multi-hole grommets for up to 4 lines per slot and special grommets e.g. for ASI cables.

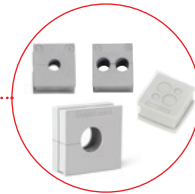
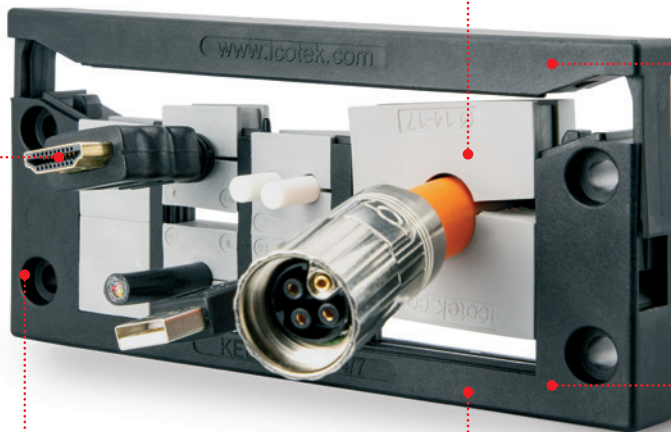
After equipping the frame with the cables or hoses, the cover lid of the KEL-QUICK is simply snapped onto the frame. A fast and easy assembly is the biggest benefit when using the QUICK series – when used with the KEL-SNAP or KEL-SNAP-5 frame a complete tool-free installation is possible.



Cut-outs according to industrial standard dimensions



Warranty on pre-terminated cables remains



High cable density, wide variety

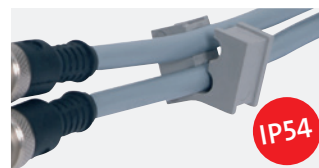


Can be combined with IMAS-CONNECT grommets



Fast and easy assembly

Split system



Grommets QUICK for cables with/without connectors, cable diameter range 1 – 15 mm

QT / QTMB / QT-DT / QT Servicebox

80 – 83



IMAS-CONNECT™ Modular adapter system for the QT system

84 – 92

Cable entry frames for quick assembly with IP rating IP54 KEL-QUICK

1.21

Product description

The KEL-QUICK range is a compact system to route and seal pre-terminated cables as well as conduits or pneumatic hoses utilising split QT and QTMB grommets. After populating the entry frame with QT/QTMB grommets and cables, the cover lid is snapped onto the frame without using assembly hardware.

The KEL-QUICK frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. The KEL-QUICK-B frames match the cut-out dimensions 46 × 36 mm. These KEL-QUICK frames can either be screw mounted or simply snapped into the KEL-SNAP frame.

The single-row KEL-QUICK-E versions are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

A flat rubber gasket is included in the shipment.

Advantages & benefits

- Fast and easy assembly and when used with the KEL-SNAP frame, mounting without tools possible
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Can be combined with IMAS-CONNECT grommets

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

QT Cable grommets	80
KEL-SNAP Mounting frames	34 - 37
KEL-EMC Cable collectors	186 - 188
KDR Base plates	218 - 227
FP Flange plates	236 - 245
MP Module plates	230 - 231
ST Plugs	55



Cover lid is simply snapped onto the frame.



Tool-free mounting with KEL-SNAP frame.



KEL-QUICK-E



Split grommets



KEL-QUICK

Cable entry frames

for quick assembly

KEL-QUICK 24, KEL-QUICK 16,

KEL-QUICK 10, KEL-QUICK-B



1.21

Description	Cut-out Drilling template	Type	Order No.	Cut-out [mm]	Grommets	PU
		KEL-QUICK 24 10	42410	112 × 36	10 –	10
		KEL-QUICK 24 7	42412	112 × 36	6 1	10
		KEL-QUICK 24 4	42413	112 × 36	2 2	10
		KEL-QUICK 16 8	42418	86 × 36	8 –	10
		KEL-QUICK 16 5	42425	86 × 36	4 1	10
		KEL-QUICK 16 2	42426	86 × 36	0 2	10
		KEL-QUICK 10 6	42420	65 × 36	6 –	10
		KEL-QUICK 10 3	42427	65 × 36	2 1	10
		KEL-QUICK-B4	42434	46 × 46	4 –	10

1.22 Split cable glands for the QT grommet system



By using split QVT cable glands by icotek cables with or without connectors or complete cable harnesses with diameters from 1 to 15 mm can be quickly routed into enclosures, cabinets or machines and be sealed with IP54 rated ingress protection.

The split system of the QVT cable glands enables quick and easy assembly which is great for retrofitting and maintenance. The cable is placed into the split grommet which is set into one of the gland halves. Depending on the size of the cable gland one, two or four separate grommets can be

installed. The two gland halves can be easily snapped together without the need of tools. The routed lines are securely sealed and held inside the grommets. To mount the cable glands either snap it into the round metric standard cut-out (sizes available from M16 to M50) or screw it with a hexagonal locknut. The mounting method is dependent on the model type.

For metric cut-outs M16 – M50

Warranty on pre-terminated cables remains

Split system

Special locknuts for e.g. D-Sub or PROFIBUS connectors as well as split locknuts available.

Fast and easy assembly

High cable density, wide variety in cable grommets

QVT-CLICK

IP54

Grommets QUICK
for cables with/without connectors,
cable diameter range 1 – 15 mm

QT / QTMB / QT-DT /
QT Servicebox **80 – 83**

IP54

IMAS-CONNECT™
Modular adapter system
for the QT system

84 – 92

Split cable glands with IP54 rating QVT and QVT-CLICK

1.22

QVT and QVT-CLICK are circular split frames for quick and easy installation of pre-terminated cables or complete cable harnesses. But also electric, pneumatic or hydraulic lines without terminals or connectors as well as corrugated conduits can be easily routed and sealed with IP54. Because of its extremely compact design, the QVT/QVT-CLICK range is especially suitable for small machines, devices and instruments.

The cable glands are easy to install. The prefabricated cable is placed into the split grommet which is set into one of the gland halves. Depending on the size of the cable gland, one, two or four separate grommets can be installed. By using multi-hole grommets up to 16 lines can be routed with one cable gland.

The QVT-CLICK can be assembled without tools from the front of the enclosure wall. Sizes QVT-CLICK 16, QVT-CLICK 20, QVT-CLICK 40|1, QVT-CLICK 50|1 and QVT-CLICK 50|4 can also be screwed on with a lock nut.

QVT: Polyamide lock nuts as well as a sealing ring are included in the shipment. QVT-CLICK: A sealing ring is included in the shipment.

Advantages QVT

- Compact design
- Routing of pre-terminated cables
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofittings, repairs and maintenance can be done much more easily and quickly
- Suitable for metric cut-outs
- Lock nut is included
- Can be combined with IMAS-CONNECT system

Advantages QVT-CLICK

- Fast and easy mounting from the front
- Snap in assembly QVT-CLICK 16/20 for wall thickness 1.5 – 2.5 mm
- Snap in assembly QVT-CLICK 25/32/40/50 for wall thickness 1 – 2.5 mm
- Screw in assembly possible for QVT-CLICK sizes 40|1, 50|1 and 50|2 for a wall thickness of 11 mm, for QVT-CLICK sizes 16 and 20 for a wall thickness up to 5 mm
- Snap-in and screw-in assembly possible for QVT-CLICK sizes 16, 20, 40|1, and for 50|1 and 50|4.

Specifications

Material	Polycarbonate (PC)
Colour	grey (similar RAL 7035)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes

Accessories

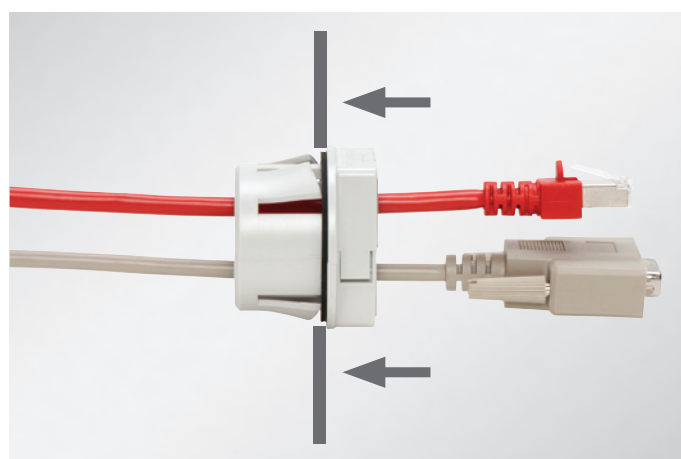
KGM lock nuts 250



QVT



QVT-CLICK



QVT-CLICK: Fast and easy mounting from the front



QVT – back view



The QVT-CLICK Tool for quick and easy mounting.
Order No. 61435 (PU: 1)

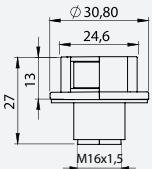
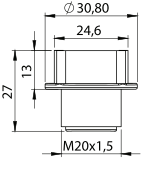
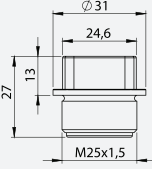
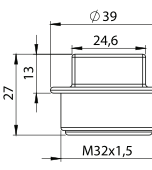
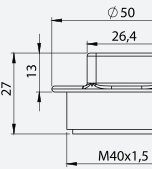
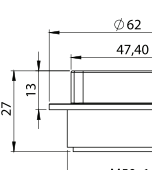
QVT

Split cable glands

1.22

IP54



Description	Type	Order No.	Cable Grommets	Thread Thread length	PU
	QVT 16* ♦	45692	1 × QT	M16 × 1.5 Length: 13 mm	10
	QVT 20**	45695	1 × QT	M20 × 1.5 Length: 13 mm	10
	QVT 25	45702	1 × QT	M25 × 1.5 Length: 13 mm	10
	QVT 32	45711	1 × QT	M32 × 1.5 Length: 13 mm	10
	QVT 40 2	45715	2 × QT	M40 × 1.5 Length: 13 mm	10
	QVT 50 4	45722	4 × QT	M50 × 1.5 Length: 13 mm	10

* Max. cable diameter of 10 mm | ** Max. cable diameter of 11 mm
♦ Cannot be combined with QT-AT-K-M

Accessories

- QT Cable grommets 80
- KVT-EMC Brackets 60 - 64
- KGM Locknuts 250
- ST Plugs 55 - 56



Type GMT: Split locknut, p. 250

QVT-CLICK

Split pluggable cable glands



IP54

1.22

Description	Type	Order No.	Cable Grommets small large	Cut-out* diameter	Thread Thread length	PU
	QVT-CLICK 16 *** *	45726	1 -	16.2 mm	M16 × 1.5 Length: 13 mm	10
	QVT-CLICK 20 *** **	45728	1 -	20.4 mm	M20 × 1.5 Length: 13 mm	10
	QVT-CLICK 25	45730	1 -	25.5 mm	-	10
	QVT-CLICK 32	45732	1 -	32.5 mm	-	10
	NEW QVT-CLICK 40 1 **	45736	- 1	40.5 mm	M40 × 1.5 Length: 19 mm	10
	QVT-CLICK 40 2	45734	2 -	40.5 mm	-	10
	NEW QVT-CLICK 50 1 **	45738	- 1	50.5 mm	M50 × 1.5 Length: 19 mm	10
	NEW QVT-CLICK 50 4 **	45740	4 -	50.5 mm	M50 × 1.5 Length: 19 mm	10

* Please consider any paint layers or powder coatings!

** Pluggable and screwable; locknut is not included in the shipment

* Sizes M16 und M20 for wall thickness up to 5 mm (screw-in assembly)

o Max. cable diameter of 10 mm

oo Max. cable diameter of 11 mm

♦ Cannot be combined with QT-AT-K-M

1.23 Split cable entry plates for the QT grommet system



KEL-QTA are push-in, split IP54 cable entry plates for wall thicknesses from 1,5 to 4 mm. icotek offers several versions for rectangular standard cut-outs as well as for round metric cut-outs. The QTA system offers a large size variety.

Split cable grommets of the QT series are used for the routing of pre-terminated cables with diameters of 1–15 mm within the KEL-QTA. In addition, there are multi-hole grommets for up to 4 lines per slot and special grommets e.g. for ASI cables.

KEL-QTA enable cable routing with or without preassembled connectors. Some types offer a combination of membranes for cable pass-through and the QT grommet system.

For metric cut-outs M20 – M50

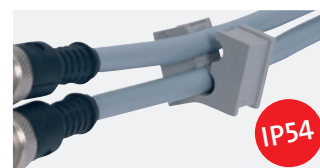
Warranty on pre-terminated cables remains

Split system

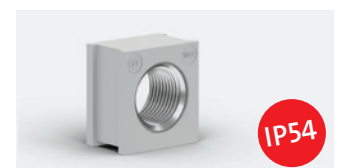
High cable density, wide variety in cable grommets

Fast and easy assembly

Cut-outs according to industrial standard dimensions



Grommets QUICK
for cables with/without connectors,
cable diameter range 1 – 15 mm
QT / QTMB / QT-DT /
QT Servicebox **80 – 83**



IMAS-CONNECT™
Modular adapter system
for the QT system
84 – 92

Push-in, split cable entry plates with IP54 rating

KEL-QTA | KEL-QTE

1.23

Product description

Push-in, split cable entry plates (IP54) for routing pre-terminated and standard cables utilising split QT grommets or membranes. Suitable for cut-outs for 10- and 24-pin industrial connectors. The compact size KEL-QTA-B is suitable for cut-outs 45.5 x 45.5 mm. The round versions of the KEL-QTA are suitable for cut-outs 32/50 mm in diameter.

The KEL-QTA/KEL-QTE easily routes pre-terminated cables, multi-conductors, hoses or conduits without using any tools for assembly.

The KEL-QTE fits on cut-outs of 20 mm in diameter.

Advantages & benefits

- Fast and easy assembly without tools
- High cable density by using multi-position grommets
- Simple assembly and disassembly in case of change or service
- Routing of cables with and without connectors in a high density
- Suitable for standard industrial connector cut-outs

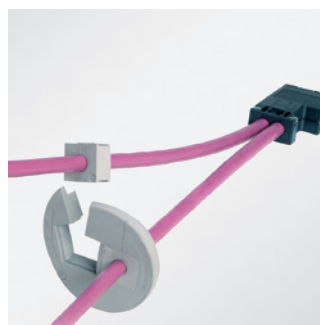
Specifications

Material	Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with correct selection of the cable grommets (QT single)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes (QTE)
Frame depth	5 mm (QTA)

Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm

Accessories

QT Cable grommets	80
ST-B Plugs	123
FP Flange plates	236 - 245



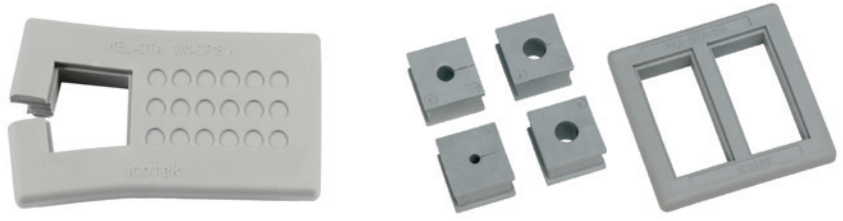
KEL-QTE (Patent)

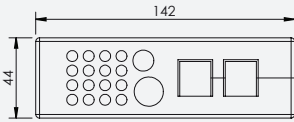
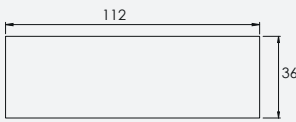
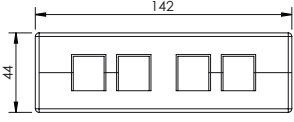
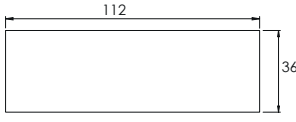
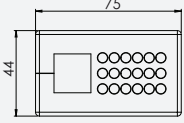
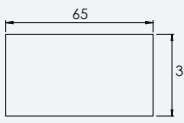
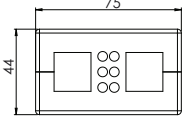
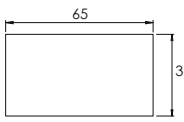
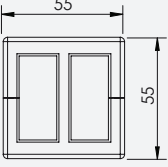
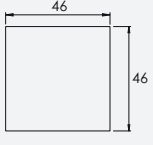
KEL-QTA

Split cable entry plates

1.23

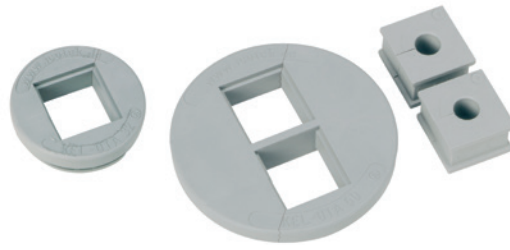
IP54



Description	Cut-out Drilling template	Type	Order No. Type A	Order No. Type B	Cut-out [mm]	Cables	PU
		KEL-QTA 24 2-DP 18	43642	43643	112 × 36	pre-terminated 2 × 1 - 15 mm without connector 16 × max. 7 mm 1 × max. 12 mm 1 × max. 16 mm	10
		KEL-QTA 24 4	43644	43645	112 × 36	pre-terminated 4 × 1 - 15 mm	10
		KEL-QTA 10 1-DP 18	43655	43658	65 × 36	pre-terminated 1 × 1 - 15 mm without connector 18 × max. 5 mm	10
		KEL-QTA 10 2-DP 6	43656	43659	65 × 36	pre-terminated 2 × 1 - 15 mm without connector 6 × max. 5 mm	10
		KEL-QTA-B4	43660	-	46 × 46	pre-terminated 4 × 1 - 15 mm	10

KEL-QTA | KEL-QTE

Split cable entry plates



IP54

1.23

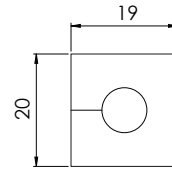
Description	Type	Order No. Type A	Order No. Type B	Cut-out [mm]	Cables		PU
					pre-terminated	non pre-term.	
	KEL-QTA 32	43632	43636	ø 32	1× 1 - 15 mm	-	10
	KEL-QTA 50	43622	43626	ø 50	2× 1 - 15 mm	-	10
	KEL-QTE 20 2.5	43412	-	ø 20	1× 2.6 - 3.2 mm	1× max. 5.2 mm	10
	KEL-QTE 20 3	43413	-	ø 20	1× 3.1 - 3.8 mm	1× max. 5.2 mm	10
	KEL-QTE 20 4	43414	-	ø 20	1× 3.8 - 4.8 mm	1× max. 5.2 mm	10
	KEL-QTE 20 5	43415	-	ø 20	1× 4.7 - 5.6 mm	1× max. 5.2 mm	10

QT

Cable grommets

1.2

IP54



Product description

The QT range supports cable diameters from 1 to 15 mm. They are used with cable entry frames and cable glands of product groups 1.21, 1.22 & 1.23.

Assembly note








When installing multiple grommets make sure the flat side of the grommet faces the other grommet. This ensures a secure seal.

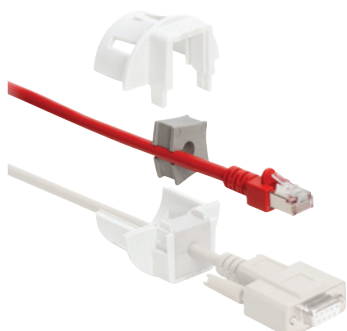
Specifications

Material	Elastomer
Flame class	UL 94 V-o, self-extinguishing
IP rating	IP54
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free

Accessories

ST Plugs	55
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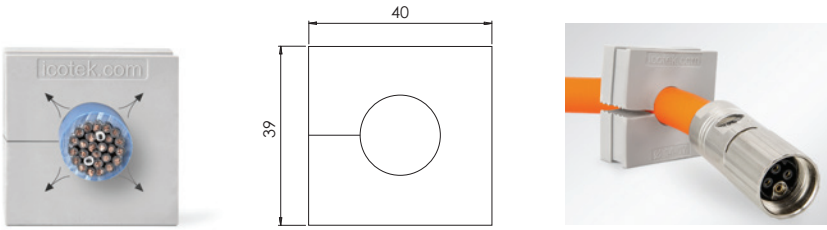
Description	Type	Order No.	Clamping range	PU	
QT small					
	QTB	QTB	42540	Blank grommet	10
	QT	QT 1	42501	1 - 2 mm	10
	QT 2	42502	2 - 3 mm	10	
	QT 3	42503	3 - 4 mm	10	
	QT 4	42504	4 - 5 mm	10	
	QT 5	42505	5 - 6 mm	10	
	QT 6	42506	6 - 7 mm	10	
	QT 7	42507	7 - 8 mm	10	
	QT 8	42508	8 - 9 mm	10	
	QT 9	42509	9 - 10 mm	10	
	QT 10	42510	10 - 11 mm	10	
	QT 11	42511	11 - 12 mm	10	
	QT 12	42512	12 - 13 mm	10	
	QT 13	42513	13 - 14 mm	10	
	QT 14	42514	14 - 15 mm	10	
	QT-ASI	QT-ASI 1	42573	1× ASI-cable	10
		QT-ASI 2	42574	2× ASI-cable	10
	QT tele	QT tele	42575	Telephone cable	10
	QT 2 x	QT 2 3	42566	2× ø 3 mm	10
	QT 2 4	42568	2× ø 4 mm	10	
	QT 2 5	42570	2× ø 5 mm	10	
	QT 2 5.5	42571	2× ø 5.5 mm	10	
	QT 2 6	42572	2× ø 6 mm	10	
	QT 2 6.5	42576	2× ø 6.5 mm	10	
	QT 2 7	42578	2× ø 7 mm	10	
	QT 4 x	QT 4 3	42580	4× ø 3 mm	10
	QT 4 4	42582	4× ø 4 mm	10	
	QT 4 4.5	42583	4× ø 4.5 mm	10	
	QT 4 5	42584	4× ø 5 mm	10	
	QT 4 5.5	42585	4× ø 5.5 mm	10	
	QT 4 6	42586	4× ø 6 mm	10	



QT grommet in combination with QVT-CLICK

QTMB

Multi-range cable grommets for QUICK systems



IP54

1.2

Product description

The new QTMB is used to route pre-terminated cables into the KEL-QUICK system.

The innovative membrane enables the routing of cables with diameters that can vary up to 3 mm.

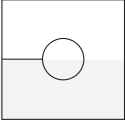
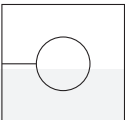
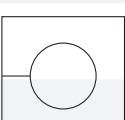
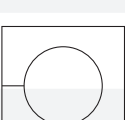
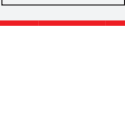



For the first time, utilising the QTMB, even large cables with cable diameters from 14 to 29 mm can be routed.

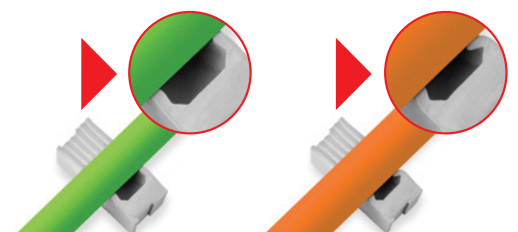
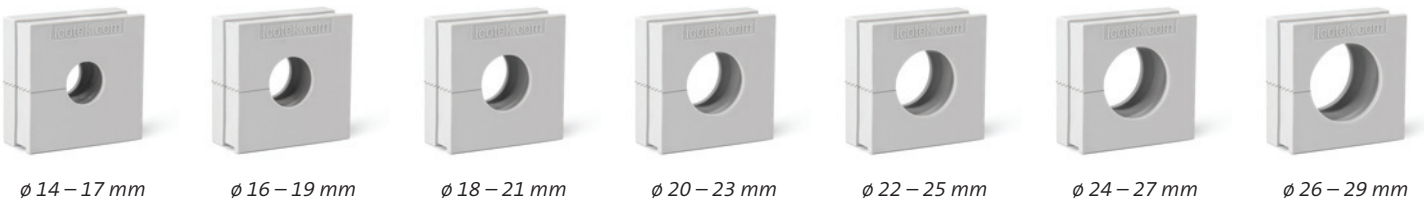
Advantages & benefits

- High flexibility: Due to the innovative membrane, one grommet can be used for various cable diameters (can vary up to 3 mm)
- For the first time, it is also suitable for large cables with clamping ranges up to 29 mm
- Innovative wave cut for more tightness

Specifications

Material	Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free

Description	Type	Order No.	Clamping range	PU
QT large				
	QTMB 14–17	42515	14–17 mm	10
	QTMB 16–19	42516	16–19 mm	10
	QTMB 18–21	42517	18–21 mm	10
	QTMB 20–23	42518	20–23 mm	10
	QTMB 22–25	42519	22–25 mm	10
	QTMB 24–27	42520	24–27 mm	10
	QTMB 26–29	42521	26–29 mm	10
	QTMB-BTG	42545	Blank grommet	10

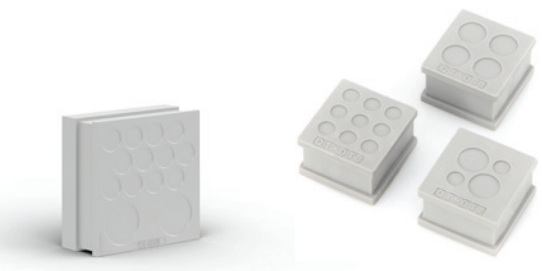


QT-DT

QT-DT grommets
for QUICK system

1.2

IP54



Product description

The new QT-DT membrane cable grommet enables the routing of cables without connectors. Using the QT-DT grommet considerably increases the cable packing density and decreases the space needed. This new grommet can be used in the KEL-QUICK cable entry frames as well as in the KEL-QTA cable entry plates. Therefore, it is possible to insert cables with and without connectors into one cable entry system.

Advantages




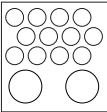
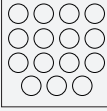
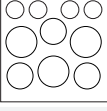
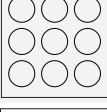
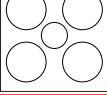
- Combination of pre-assembled and non-assembled cables in one cable entry product
- Very high packing density
- Considerable space and cost savings
- Pre-assembly of individual assemblies possible

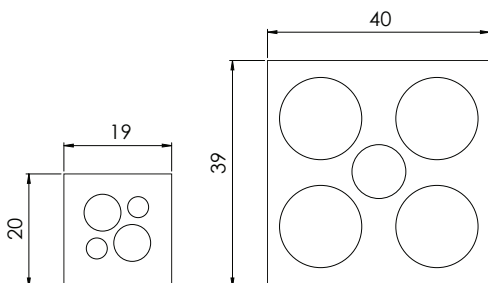
Specifications

Material	Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free

Accessories

ST Plugs 55

Description	Type	Order No. grey	Clamping range	PU
QT-DT small				
	QT-DT 1	42550	4x max. 6.5 mm	10
	QT-DT 2	42551	2x max. 3.5 mm 2x max. 6.5 mm	10
	QT-DT 3	42552	9x max. 3.5 mm	10
QT-DT large				
	QT-DT 8	42556	12x max. 6.5 mm 2x max. 12.2 mm	10
	QT-DT 9	42557	15x max. 7.1 mm	10
	QT-DT 10	42558	4x max. 6.5 mm 3x max. 9.5 mm 3x max. 11.3 mm	10
	QT-DT 11	42559	9x max. 9.5 mm	10
	QT-DT 12	42560	4x max. 14.5 mm 1x max. 9.5 mm	10



QT ServiceBox

Service box
for cable grommets



Product description

Convenient – everything available right away!

The QT ServiceBox is perfect for installations and service calls. It ensures your QT grommets are readily available.

Order No. 88005

Content*

Cable grommets:

- 210 QT for cables 1 - 15 mm
- 10 QT-B blank grommets
 - 1 QT-DT 1
 - 1 QT-DT 2
 - 1 QT-DT 3

5 Cable entry components:

- 1 KEL-QTA 50 A cable entry plates
- 1 KEL-QTA 32 A cable entry plate
- 1 KEL-QTA 24|2-DP 18 A cable entry plate
- 1 KEL-QTA 10|1-DP 18 A cable entry plate
- 1 KEL-QUICK 24|10 cable entry frame
- 1 QVT 25 split cable gland
- QVT-CLICK 32 split cable gland

1 Accessories:

- Cable template

* Subject to alterations



KMS Cable template

The correct size of the QT grommets can easily be determined by using the cable template

- Determining the diameter of the cable using the cable template
- Selecting the QT grommets according to the data on the cable template

Cable templates can also be ordered separately. **Order-No. 39800**



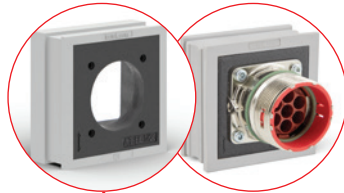
1.24 Modular adapter system IMAS-CONNECT™ for the QT system



The IMAS-CONNECT™ adapter system by icotek is a modular designed grommet system for mounting metric connectors, PushPull modules, Keystone couplers, hose fittings, pressure compensation elements and much more.

By utilising the modular adapter system, the cable entry frame becomes a hybrid system. Pre-terminated and standard cables or hoses can be routed and at the same time the system serves as an interface for connectors.

The grommets, made of elastomer with a polyamide body, fit perfectly into the icotek cable entry frames like e.g. KEL-QUICK and meet the protection class IP54.



Adapter grommet for M23 square flange (QT-AT-FL)



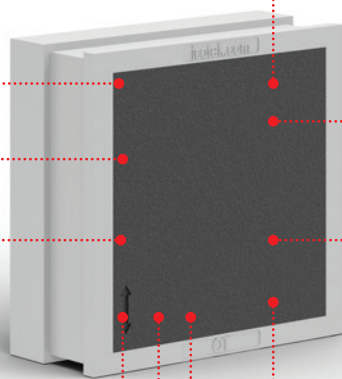
Available with threaded insert (QT-AT-K-M), based on the QT cable grommet.



Available with pre-terminated cut-out for PushPull systems (QT-AT-PP)



Available with metric inner threads of M12 x 1.0, M16 x 1.5, M20 x 1.5 and M25 x 1.5 (QT-AT-M).



Perfect integration into the split icotek cable entry frames.

Usable area for special cut-outs and drill-holes: 24 x 24 mm; Wall thickness: 6 mm (QT-AT-B)

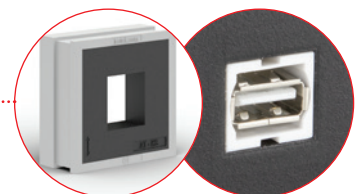


At a high cable density only one cut-out is necessary.

Elastomer grommet with polyamide body based on the grommet QT large.

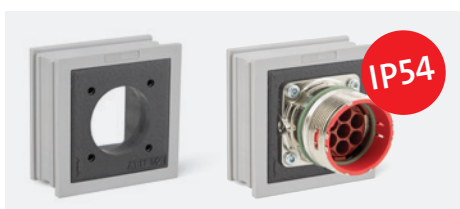
Protection class IP54

Available with pre-terminated cut-out for Keystone couplers (QT-AT-KS).



Chapter content

1.24



Adapter grommet for M23 square flange

QT-AT-FL

NEW

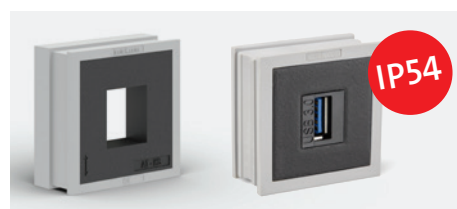
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Adapter grommet for PushPull connector systems

QT-AT-PP

87



Adapter grommet for Keystone couplers

QT-AT-KS

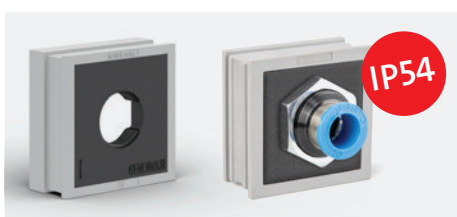
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Adapter grommet, small with threaded insert

QT-AT-K-M

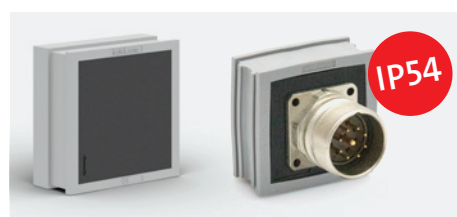
89



Adapter grommet with metric inner thread

QT-AT-M

90



Adapter grommet, blank

QT-AT-B

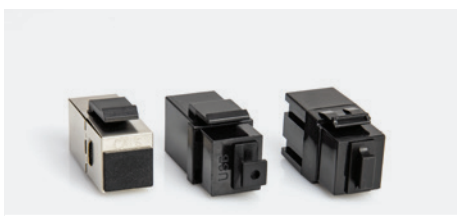
90



Adapter grommet with mounted Keystone modules

NEW

91



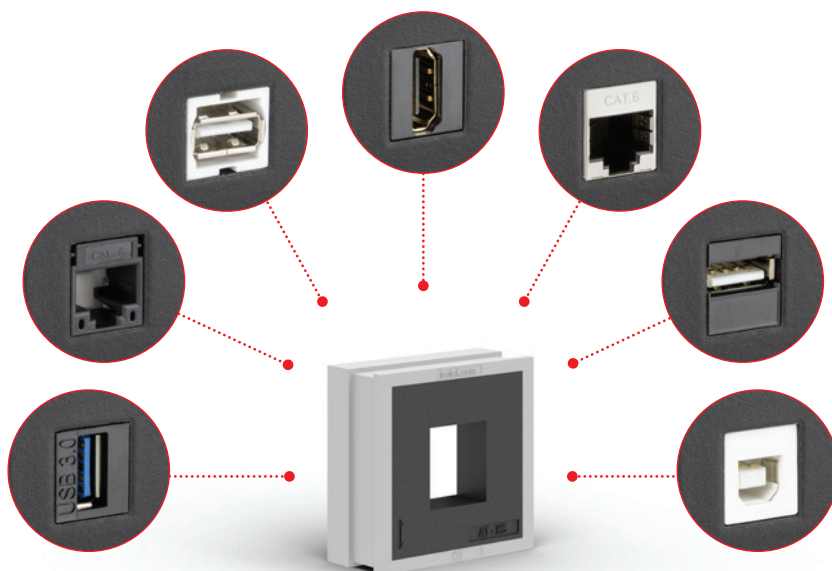
Keystone modules, bulkhead couplings and accessories

NEW

92

Various application examples

USB, RJ45, HDMI and approx. 70 other Keystone couplers.



QT-AT-FL

Adapter grommet for M23 square flange

1.24

IP54



Product description

The grommet QT-AT-FL is constructed on the basis of a large QT cable grommet. The polyamide body is moulded with elastomer. All square flanges with dimensions 19.8 x 19.8 mm (M23) can be integrated.

The insertion of QT-AT-FL into an icotek cable entry frame enables the routing of cables with and without connectors in combination with the creation of interfaces for M23 connectors within one cable entry system. Separate cut-outs for connectors are no longer necessary.

QT-AT-FL provides ingress protection of up to IP65 (depending on the used flange and connector).

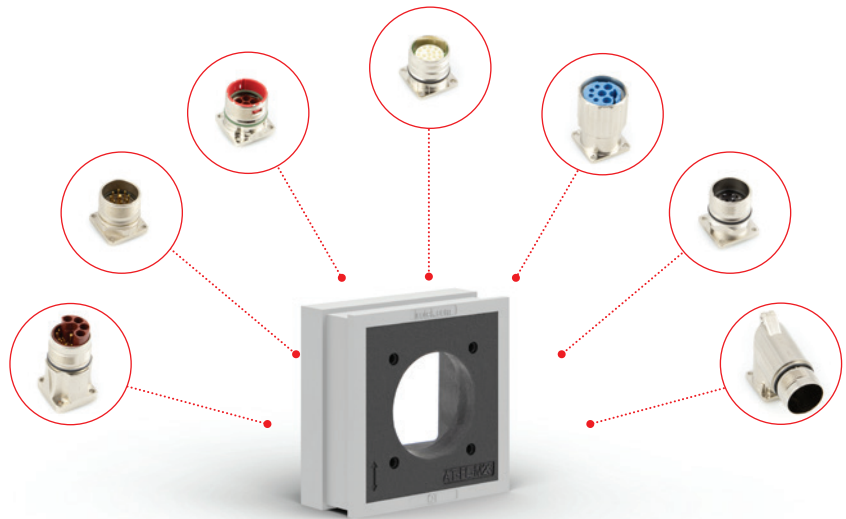
Advantages & benefits

- By using the QT-AT-FL grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Cost-saving assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54, IP55, IP64, IP65
Temperature	-40°C to +90°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Material	PU
QT-AT-FL	42608	42 x 41.5 x 19	PA/Elastomer	5



QT-AT-PP

Adapter grommet for PushPull connector systems



IP54

1.24

Type	Order No.	Height × width × length [mm]	Material	PU
QT-AT-PP	42602	39 × 40 × 17	PA/Elastomer	10



The module (left) snaps into the rear of the add-on housing mounted on the QT-AT-PP.



Product description

The grommet QT-AT-PP is constructed on the basis of a large QT cable grommet. In this elastomer grommet, a polyamide body is integrated. All modules based on the PushPull system can be inserted into the grommet.

By using the grommet QT-AT-PP, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

PushPull modules and add-on housings are not included in the scope of delivery.

Advantages & benefits

- By using QT-AT-PP grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Time saving solution
- Space-saving solution
- Assembly costs are reduced

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



QT-AT-KS

Adapter grommet for Keystone couplers

1.24

IP54



Product description

The grommet QT-AT-KS is constructed on the basis of a QT cable grommet. In this elastomer grommet, a polyamide body is integrated. All couplers based on the Keystone system can be simply snapped in.

By using the grommet QT-AT-KS, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

Advantages & benefits

- By utilising the QT-AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Grommet is suitable for all Keystone couplers
- Snap-in assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Material	PU
QT-AT-KS	42601	39 x 40 x 17	PA/Elastomer	10

Type	Order No.	Height x Width x Length [mm]	Colour Keystone module	PU
QT-AT-KS-USB 3.0	42644	39 x 40 x 17	black	1
QT-AT-KS-HDMI	42645	39 x 40 x 17	black	1
QT-AT-KS-CAT6	42646	39 x 40 x 17	silver	1



USB-, RJ45 or e.g. HDMI connectors can be plugged in from the front and from the back.



QT-AT-K-M

Adapter grommet with threaded insert



IP54

1.24

Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
QT-AT-K-M 5x0.5	42604	20 x 19 x 17	M5 x 0.5	Brass/Elastomer	5
QT-AT-K-M 8x0.5	42609	20 x 19 x 17	M8 x 0.5	Brass/Elastomer	5 NEW
QT-AT-K-M 8x1.0	42605	20 x 19 x 17	M8 x 1.0	Brass/Elastomer	5
QT-AT-K-M 12x1.0	42606	20 x 19 x 17	M12 x 1.0	Brass/Elastomer	5
QT-AT-K-M 12x1.5	42607	20 x 19 x 17	M12 x 1.5	Brass/Elastomer	5

Product description

The QT-AT-K-M grommet is constructed on the basis of a QT cable grommet. The grommets are made of elastomer with a nickel-plated brass body. The QT-AT-K-M grommets are available with inner threads in sizes M5 x 0.5, M8 x 0.5, M8 x 1.0, M12 x 1.0, M12 x 1.5.

By using the QT-AT-K-M adapter grommet, several connectors can be inserted directly into the cable entry frame, e.g. pneumatic bulkhead connectors M12 x 1.0 and M14 x 1.0, metric connectors and pressure compensation elements.

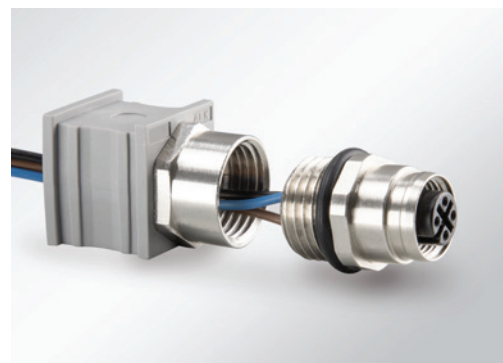
They are compatible with all split icotek cable entry systems that are suitable for QT cable grommets.

Advantages & benefits

- By using QT-AT-K-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M5 to M12 available

Specifications

Material	Grommet: Elastomer Body: nickel-plated brass
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C bis +100°C (static)
Properties	Halogen free, silicone free



AT-K-M with extension M16x1,5 for M12 built-in connectors

QT-AT-M

Adapter grommet with metric inner thread

1.24

IP54



Product description

QT-AT-M is a grommet (based on large QT grommets) with integrated metric threads, suitable for split icotek cable entry systems. The QT-AT-M grommets are made of elastomer with a polyamide body. QT-AT-M grommets are available with inner threads in sizes M12x1.0, M16x1.5, M20x1.5 and M25x1.5.

The QT-AT-M is ideal for creating an interface for signal, data, power and hybrid connectors by simply screwing them into the QT-AT-M thread. Pressure compensation elements or conduit connectors up to M25x1.5 can also be screwed into the QT-AT-M.

There is also a blank QT-AT-B grommet available. The integrated polyamide body is completely closed on one side. The effective area is 24 x 24 mm, the wall thickness is 6 mm. Custom drill-holes and cut-outs can be made here for e.g. installation of screw mounted hybrid connectors.

icotek also offers screw plugs for sizes M16, M20 and M25 to close the new adapter grommet with the metric internal thread QT-AT-M.

Advantages & benefits

- By using QT-AT-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M12 to M25 available

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
QT-AT-M 12x1,0	42596	39 x 40 x 17	M12 x 1.0	PA/Elastomer	10
QT-AT-M 16x1,5	42597	39 x 40 x 17	M16 x 1.5	PA/Elastomer	10
QT-AT-M 20x1,5	42598	39 x 40 x 17	M20 x 1.5	PA/Elastomer	10
QT-AT-M 25x1,5	42599	39 x 40 x 17	M25 x 1.5	PA/Elastomer	10
QT-AT-B blank	42600	39 x 40 x 17	-	PA/Elastomer	10



Screw plugs for QT-AT-M

Type	Order No.	Thread	Material	PU
Screw plug M16 x 1.5	99195	M16	Polyamide	10
Screw plug M20 x 1.5	99196	M20	Polyamide	10
Screw plug M25 x 1.5	99197	M25	Polyamide	10



Adapter grommet with mounted Keystone modules



1.24

Type	Order No.	Height x Width x Length [mm]	Colour Keystone module	PU
QT-AT-KS-USB 3.0	42644	39 x 40 x 17	black	1
QT-AT-KS-HDMI	42645	39 x 40 x 17	black	1
QT-AT-KS-CAT6	42646	39 x 40 x 17	silver	1

Product description

The adapter grommets type QT-AT-KS are also supplied with pre-assembled keystone module.

Advantages

- By utilising the QT-AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Keystone modules are already pre-assembled

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



Keystone modules, bulkhead couplings and accessories



Keystone modules

Type	Order No.	Colour	PU
Keystone module USB 3.0	99204	black	5
Keystone module HDMI	99205	black	5
Keystone module CAT 6	99206	silver	5

Bulkhead couplings

Type	Order No.	suitable for pneumatic hose	Thread	PU
Bulkhead coupling	99210	4 mm	M12 x 1,0	10
Bulkhead coupling	99211	6 mm	M12 x 1,0	10

Dust caps

Type	Order No.	suitable for	PU
Dust caps for HDMI	99207	HDMI connectors	5
Dust caps for USB	99208	USB connectors	5
Dust caps for RJ-45	99209	RJ-45 connectors	5

Product description

The Keystone modules and bulkhead couplings are also available individually for use with the adapter grommets.

Advantages

- By utilising the adapter grommets, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Snap-in assembly

Specifications

Material	Bulkhead coupling: Brass nickel plated
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP54 depending on module type and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



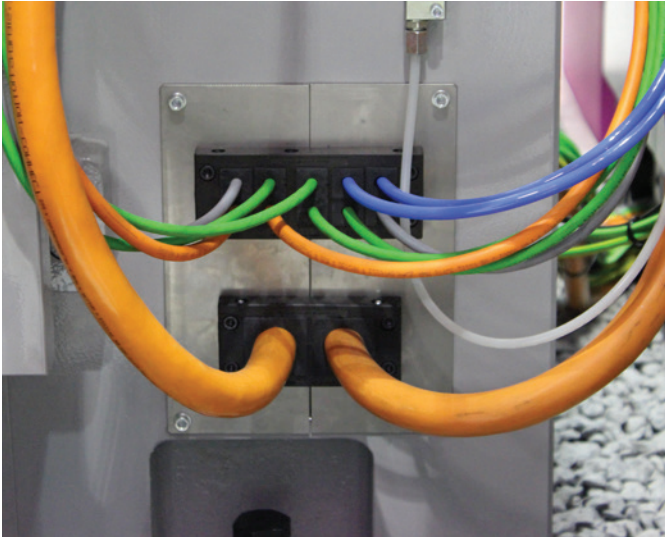


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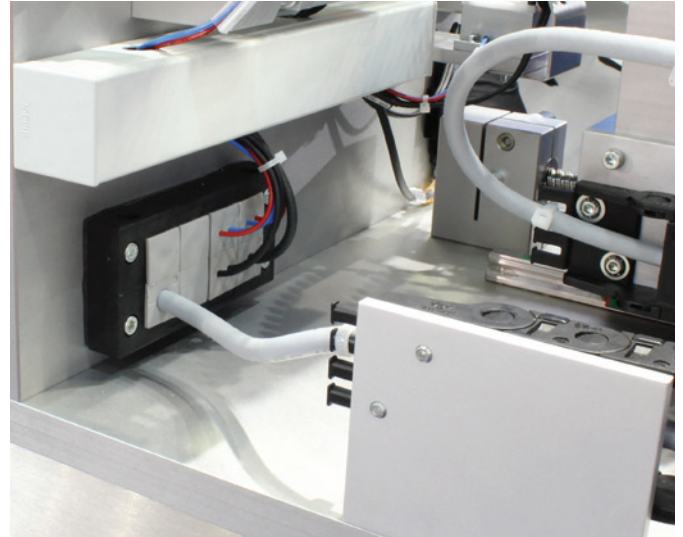
Typical applications

Cable entry systems for pre-terminated cables

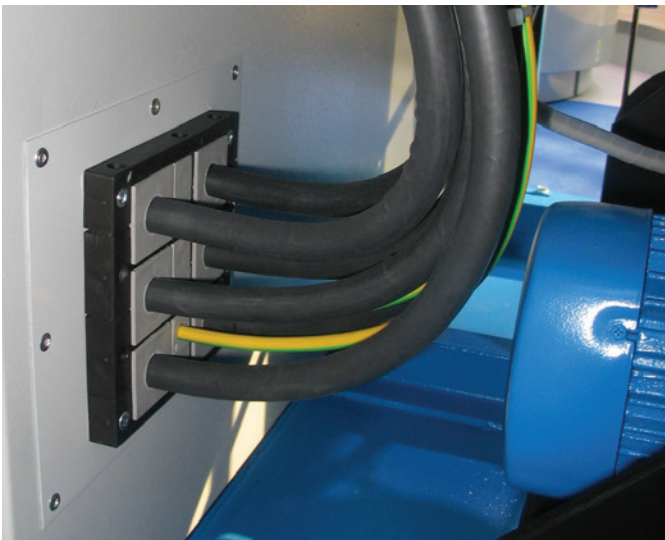
1.2



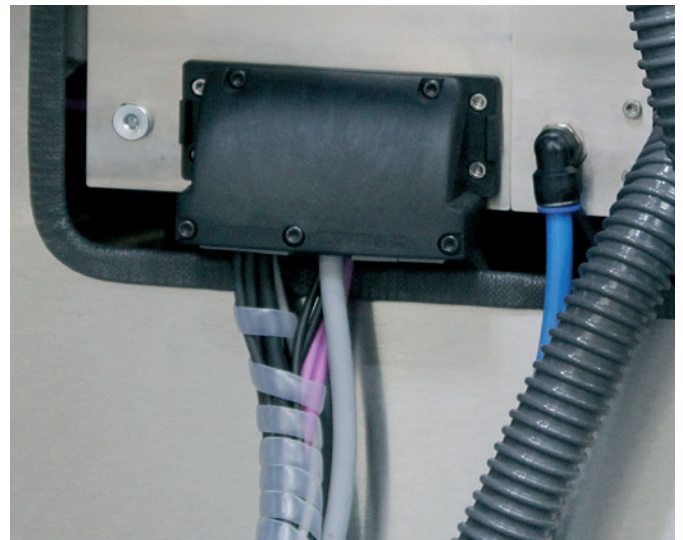
KEL-U 24|10 / KEL-U 16|2
Routing of 12 cables with various diameters (some of them assembled with connectors) into the body of a grinding machine.



KEL 16|8
Routing of several pre-terminated lines into the electrical enclosure of a tension measuring machine.



KEL 24|12-2MT
Routing of 6 large cables up to 35 mm with one cable entry frame.



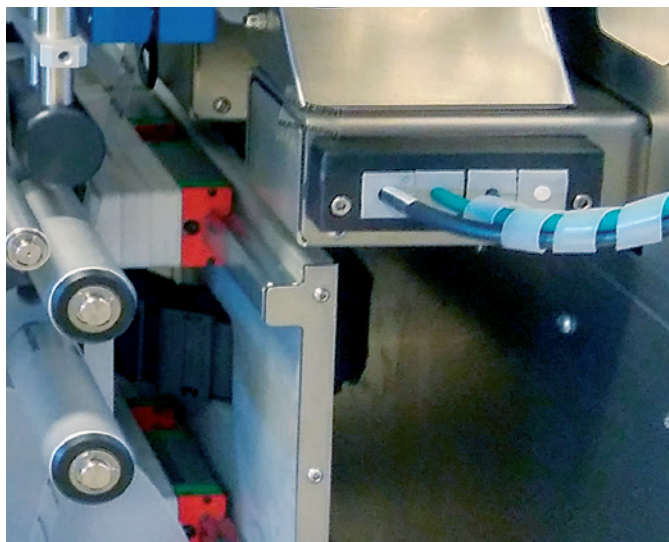
KEL-FG A10
Used in combination with drag chains to provide strain relief and compact, high density cable entry into an integrated switch cabinet.



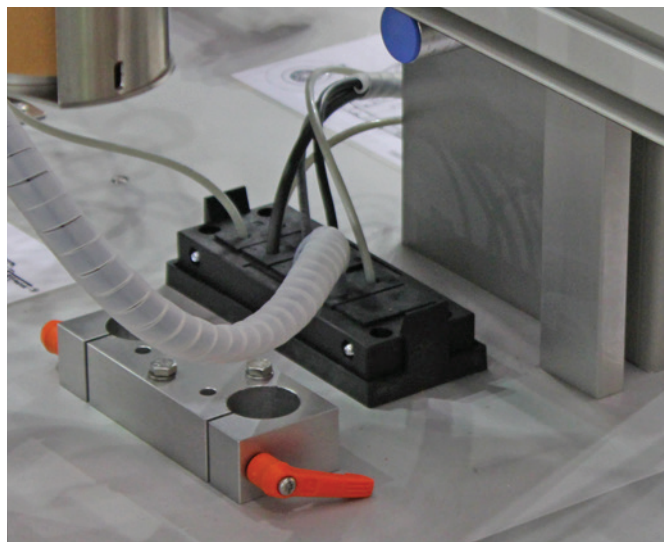
KEL-JUMBO 2 / KEL 24|x
Routing of conduits and large cables between vehicle body and chassis



KVT 50-W90
Low profile 90 degree routing of a terminated cable from a control panel into the machine



KEL-QUICK-E4
Routing of cables with connectors into a control panel / IPC



KEL-QUICK 24|10 / KEL-SNAP 24
Routing of corrugated conduits into an external enclosure of a construction machine. Tool-free mounting/unmounting with snap frame.

2 Cable entry systems for cables without connectors



2 For routing cables without connectors icotek offers a wide range of products with a lot of advantages and benefits in comparison to conventional cable glands.

The compact, slim and innovative design of the membrane-based cable entry plates offer a professional appearance and high ingress protection ratings up to IP68/UL type 4X.

Due to high cable densities especially suitable for applications where a lot of cables have to be entered through a small space.

For routing rigid and large diameter cables icotek offers highly flexible conical cable entry grommets with high protection ratings.



ProductFinder

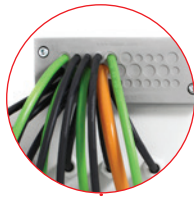
Product	IP54	IP64	IP65	IP66	IP68	UL TYPE 12	UL TYPE 4X	Strain relief	Cleanroom	Cable Ø mm min max	Max. no. of cables	Page
KEL-DPU 24	■	■	■	■	■	■	■	■		3.2 – 20.5	32	100 – 101
KEL-DPZ 24	■	■	■	■		■		■		2.5 – 22	119	102 – 104
KEL-DPZ 16	■	■	■	■				■		3.2 – 16.2	34	105
KEL-DPZ 10	■	■	■	■				■		3.2 – 12	26	106
KEL-DPZ 6	■	■	■	■				■		2.5 – 8	27	107
KEL-DPZ-B	■	■	■	■		■		■		3.2 – 22	25	108
KEL-DPZ-E	■	■	■	■		■		■		3.2 – 12	21	109
KEL-DPZ-KL	■	■	■			■		■		3.2 – 22	72	109
KEL-DPZ round	■	■	■	■	■	■	■	■		1.5 – 22.2	78	110 – 111
KEL-DPZ-CLICK round	■	■	■	■	■			■		1.5 – 22.2	78	112 – 113
KEL-DPZ CR	■	■	■	■	■	■	■	■	■	1.5 – 22.2	78	183 – 185
KEL-DP 24	■	■				■				max. 16.1	48	115
KEL-DP 16	■	■				■				max. 12.6	26	116
KEL-DP 10	■	■				■				max. 12.6	26	117
KEL-DP 6	■	■				■				max. 16.1	25	118
KEL-DP-E	■	■				■				max. 12.1	21	119
KEL-DP round	■	■	■			■				max. 22.5	35	120 - 122
KEL-DPU-HD	■	■	■	■	■			■		3.2 – 20.5	32	128 – 129
KEL-DPZ-HD round	■	■	■	■	■	■	■	■		1.5 – 22.2	78	130 – 131
KEL-SCDP	■	■	■							5 – 36	1	136–137
KEL-DPF	■	■	■	■	■	■	■	■		3 – 70	1	138–139
KEL-JUMBO flex	■					■		■		27 – 68	1	141
KEL-ULTRA flex	■	■	■	■		■		■		25 – 115	1	140

Further details on certifications and technical specifications can be found on the product pages.

2.1 Cable entry plates for cables without connectors



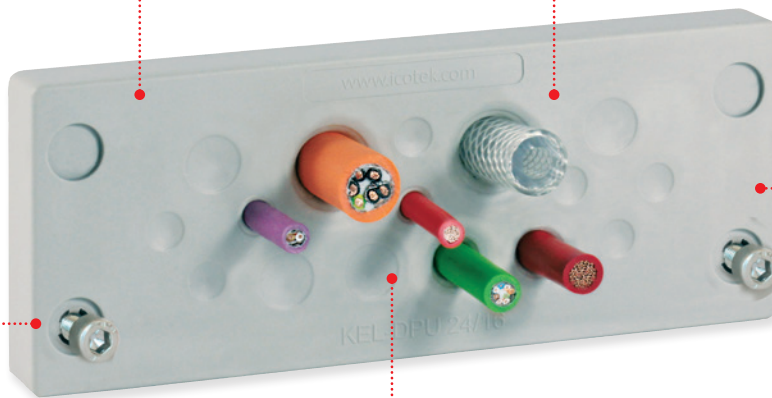
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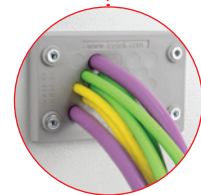
High cable density



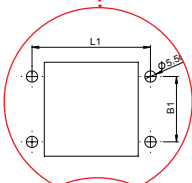
Fast and easy, partially tool-free assembly



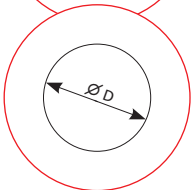
Compact, space-saving design



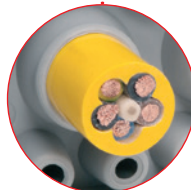
IP64 to IP68 rated protection, double cable sealing on front and back (KEL-DPU/KEL-DPZ)



Many cut-outs according to industrial standard dimensions



For metric cut-outs M20 – M63 (KEL-DPZ/KEL-DP round)



Flexible clamping range

Chapter content

2.1



Cable entry plates
screw-in or snap-in mounting,
high strain relief

KEL-DPU 24

100 – 101



Cable entry plates
screw mounting, strain relief

KEL-DPZ 24 / KEL-DPZ 16 / KEL-DPZ 6

102 – 108



Cable entry plates
screw mounting, strain relief

KEL-DPZ-KL

109



Cable entry plates, round
with thread and locknut M25 – M63,
strain relief

KEL-DPZ round

110 – 111



Cable entry plates
for snap-in or screw-in mounting
M25 – M63

KEL-DPZ-CLICK round series

112 – 113



Cable entry plates
plug-in mounting

KEL-DP 24 / KEL-DP 16/ KEL-DP 6

114 – 119



Cable entry plates, round
plug-in mounting, M20 – M50

KEL-DP round

120 – 122



Plugs for membranes

ST-B

123



Cover plugs
for cable entry plates

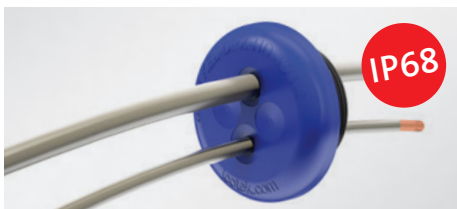
124



Cable entry plates
screw-in or snap-in mounting,
high strain relief
Hygienic Design Line

KEL-DPU-HD

128 – 129



Cable entry plates, round
with thread and locknut
Hygienic Design Line

KEL-DPZ-HD round

130 – 131

Heavy-duty cable entry plates with high strain relief with IP66/IP68 rating KEL-DPU

2.1 Product description

KEL-DPU entry plates are designed to route and seal cables without connectors (from 3.2 mm to 20.5 mm in diameter) in limited space with IP66/IP68**/up to UL type 4X ratings. The KEL-DPU is particularly characterised by its solid robust frame and the increased strain relief of the routed cables.

The KEL-DPU 24 matches exactly the cut-out dimensions of 24-pin standard industrial connectors. For optional screw assembly just pierce the membranes on the integrated screw holes with the screw itself.

The assembly of the KEL-DPU with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane and push the cables through. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

The version with threaded bushings enables the cable entry plate to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Dual cable sealing with IP66/IP68**/up to UL type 4X
- Snap or screw mounting possible
- High strength and stability
- High strain relief
- Fast and easy assembly
- Very high cable density
- Hygienic design – free of dirt-collecting recesses

Specifications

Material	Frame: Polypropylene (PP) Sealing plate: Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP66/IP67/IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	14 mm
For wall thickness	1.5 - 2 mm (snap-in mounting)

Accessories

ST-B Plugs	123
KEL-EMC-PF Cable collectors	187
FP Flanged plates	236 - 245



Tool-free assembly possible due to snap-in function



Membrane on front



Conical shape on back provides additional sealing and strain relief



Resistant against industrial detergents (ECOLAB certified)



Also available in black



Also available with threaded bushings

KEL-DPU

Heavy-duty cable entry plates with high strain relief

KEL-DPU 24


2.1

Description	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPU 24 13	36 x 112 mm	10x 3.2 - 6.3 mm 3x 16 - 20.5 mm	■ 43940 ■ 50940	10
		KEL-DPU 24 13 with threaded bushings M4	36 x 112 mm		■ 43940.400 ■ 50940.400	10
		KEL-DPU 24 14	36 x 112 mm	5x 3.2 - 6.3 mm 2x 4 - 7.5 mm 3x 5.5 - 10.5 mm 1x 8 - 12.5 mm	■ 43944 ■ 50944	10
		KEL-DPU 24 14 with threaded bushings M4	36 x 112 mm		■ 43944.400 ■ 50944.400	10
		KEL-DPU 24 16	36 x 112 mm	8x 3.2 - 5.5 mm 6x 5 - 8.5 mm 2x 9.5 - 14.5 mm	■ 43936 ■ 50936	10
		KEL-DPU 24 16 with threaded bushings M4	36 x 112 mm		■ 43936.400 ■ 50936.400	10
		KEL-DPU 24 16-1	36 x 112 mm	2x 3.2 - 6.3 mm 9x 4 - 7.5 mm 1x 5.5 - 10.5 mm 1x 8 - 12.5 mm	■ 43932 ■ 50932	10
		KEL-DPU 24 16-1 with threaded bushings M4	36 x 112 mm		■ 43932.400 ■ 50932.400	10
		KEL-DPU 24 17	36 x 112 mm	4x 3.2 - 6.3 mm 2x 4 - 7.5 mm 1x 5.5 - 10.5 mm 10x 8 - 12.5 mm	■ 43934 ■ 50934	10
		KEL-DPU 24 17 with threaded bushings M4	36 x 112 mm		■ 43934.400 ■ 50934.400	10
		KEL-DPU 24 20	36 x 112 mm	12x 3.2 - 5.5 mm 8x 5 - 10.5 mm	■ 43938 ■ 50938	10
		KEL-DPU 24 20 with threaded bushings M4	36 x 112 mm		■ 43938.400 ■ 50938.400	10
		KEL-DPU 24 21	36 x 112 mm	1x 3.2 - 6.3 mm 14x 4 - 7.5 mm 4x 5.5 - 10.5 mm 2x 8 - 12.5 mm	■ 43930 ■ 50930	10
		KEL-DPU 24 21 with threaded bushings M4	36 x 112 mm		■ 43930.400 ■ 50930.400	10
		KEL-DPU 24 32	36 x 112 mm	32x 3.2 - 6.3 mm	■ 43942 ■ 50942	10
		KEL-DPU 24 32 with threaded bushings M4	36 x 112 mm		■ 43942.400 ■ 50942.400	10

* Only valid for grey product types | ** IP68 only when screw mounted

Cable entry plates with IP66 rating KEL-DPZ series

2.1 Product description

KEL-DPZ cable entry plates are designed to route and seal a large number of cables without connectors, hoses or fibre optics (from 2.5 mm to 22 mm in diameter) in limited space. The KEL-DPZ products are a cost and time saving alternative to traditional cable glands.

The assembly of the KEL-DPZ with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane, push the cables through. The KEL-DPZ provides strain relief and protection up to IP66/UL type 12.

The KEL-DPZ matches exactly the cut-out dimensions of 6-, 16- and 24-pin standard industrial connectors. The size KEL-DPZ-B fits on cut-outs 46 × 46 mm. The very compact size KEL-DPZ-E is designed for routing cables in very small space. Through a cut-out of only 18 × 112 mm, up to 21 cables can be easily routed and sealed.

Especially for Rittal KL and KX terminal boxes the size KEL-DPZ-KX/KL was created. It was designed for routing up to 72 cables through the pre-cut standard cut-out. The self-tapping screws (M4) required for assembly are included in the scope of delivery. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

The version with threaded bushings enables the cable entry plate to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Dual sealing acc. to IP65/IP66/UL type 12
- Fast and easy assembly
- High cable density
- High strain relief
- Hygienic design

Specifications

Material	Frame: Polyamide (PA) Stainless steel V2A: KEL-DPZ 6 + KEL-DPZ-KX/KL
Colour	Sealing plate: Elastomer ■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP65/IP66 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	14 mm

Accessories

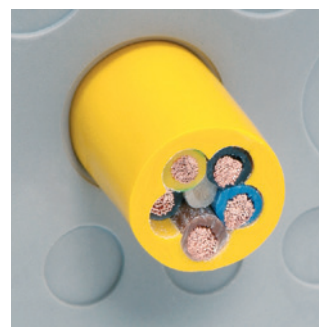
ST-B Plugs	123
KEL-EMC-PF Cable collectors	187
FP Flanged plates	236 - 245



Also available in black



Also available with threaded bushings



Membrane on front



Conical shape on back provides additional sealing and strain relief



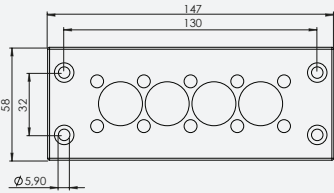
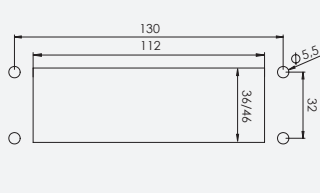
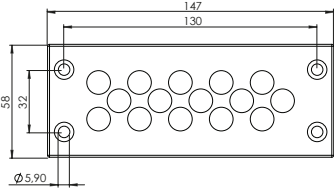
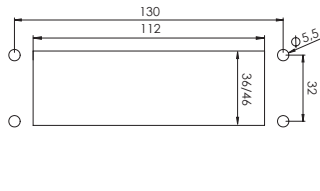
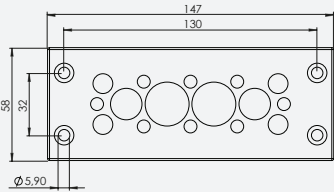
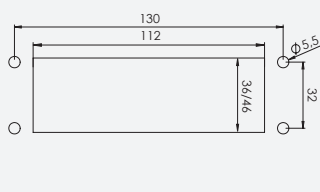
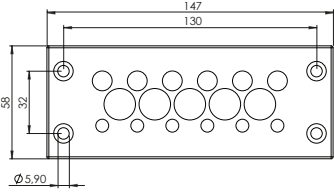
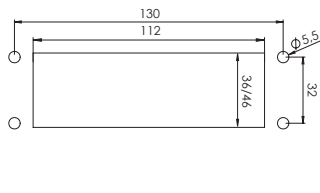
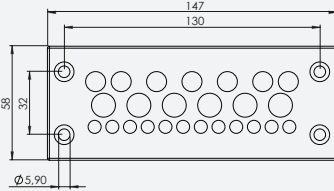
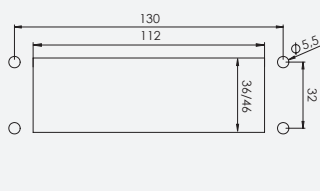
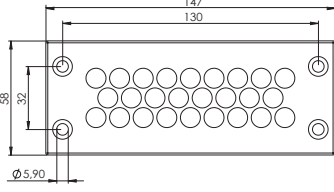
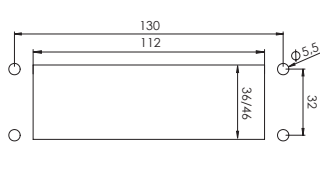
The KEL-DPZ series is also available as a cleanroom version, see from page 283.

KEL-DPZ

Cable entry plates

KEL-DPZ 24



Description	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 24 14	36 x 112 mm	10x 3.2 - 6.5 mm 4x 16 - 22 mm	■ 43700 ■ 50700	10
		KEL-DPZ 24 14 with threaded bushings M4	36 x 112 mm	10x 3.2 - 6.5 mm 4x 16 - 22 mm	■ 43700.400 ■ 50700.400	10
		KEL-DPZ 24 15	36 x 112 mm	15x 7.2 - 12 mm	■ 43720 ■ 50720	10
		KEL-DPZ 24 15 with threaded bushings M4	36 x 112 mm	15x 7.2 - 12 mm	■ 43720.400 ■ 50720.400	10
		KEL-DPZ 24 16	36 x 112 mm	8x 3.2 - 6.5 mm 4x 5 - 9.7 mm 2x 9 - 16.2 mm 2x 16 - 22 mm	■ 43725 ■ 50725	10
		KEL-DPZ 24 16 with threaded bushings M4	36 x 112 mm	8x 3.2 - 6.5 mm 4x 5 - 9.7 mm 2x 9 - 16.2 mm 2x 16 - 22 mm	■ 43725.400 ■ 50725.400	10
		KEL-DPZ 24 17	36 x 112 mm	6x 3.2 - 6.5 mm 6x 5 - 10.2 mm 5x 9 - 16.2 mm	■ 43705 ■ 50705	10
		KEL-DPZ 24 17 with threaded bushings M4	36 x 112 mm	6x 3.2 - 6.5 mm 6x 5 - 10.2 mm 5x 9 - 16.2 mm	■ 43705.400 ■ 50705.400	10
		KEL-DPZ 24 25	36 x 112 mm	12x 3.2 - 6.5 mm 7x 4.8 - 9.7 mm 6x 7.5 - 12 mm	■ 43710 ■ 50710	10
		KEL-DPZ 24 25 with threaded bushings M4	36 x 112 mm	12x 3.2 - 6.5 mm 7x 4.8 - 9.7 mm 6x 7.5 - 12 mm	■ 43710.400 ■ 50710.400	10
		KEL-DPZ 24 26	36 x 112 mm	26x 5.0 - 10.2 mm	■ 43711 ■ 50711	10
		KEL-DPZ 24 26 with threaded bushings M4	36 x 112 mm	26x 5.0 - 10.2 mm	■ 43711.400 ■ 50711.400	10

* Only valid for grey product types

KEL-DPZ

Cable entry plates

KEL-DPZ 24

IP66



2.1

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 24 32	36 x 112 mm	21x 3.2 - 6.5 mm 8x 5 - 10.2 mm 3x 7.5 - 12 mm	■ 43730 ■ 50730	10
		KEL-DPZ 24 32 with threaded bushings M4	36 x 112 mm	21x 3.2 - 6.5 mm 8x 5 - 10.2 mm 3x 7.5 - 12 mm	■ 43730.400 ■ 50730.400	10
		KEL-DPZ 24 42	36 x 112 mm	42x 3.2 - 6.5 mm	■ 43715 ■ 50715	10
		KEL-DPZ 24 42 with threaded bushings M4	36 x 112 mm	42x 3.2 - 6.5 mm	■ 43715.400 ■ 50715.400	10
		KEL-DPZ 24 121	36 x 112 mm	119x 1.5 - 2.6 mm 2x 2.5 - 5 mm	■ 43735 ■ 50735	10
		KEL-DPZ 24 121 with threaded bushings M4	36 x 112 mm	119x 1.5 - 2.6 mm 2x 2.5 - 5 mm	■ 43735.400 ■ 50735.400	10

* Only valid for grey product types



High cable density



KEL-DPZ 16

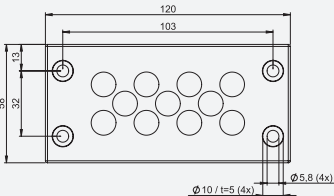
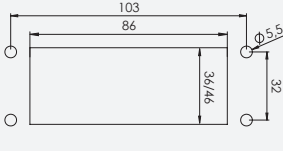
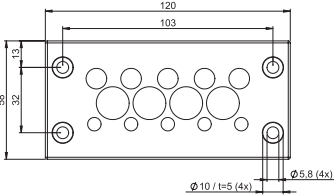
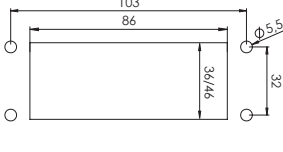
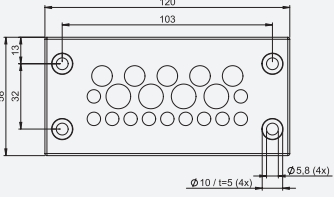
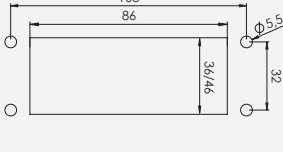
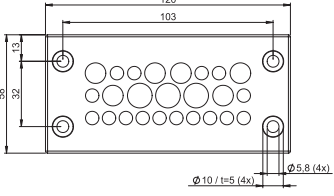
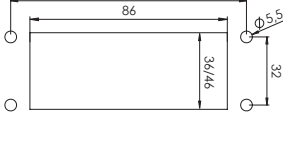
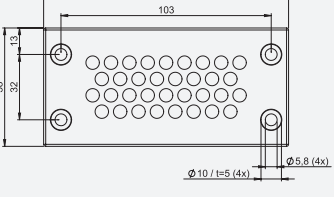
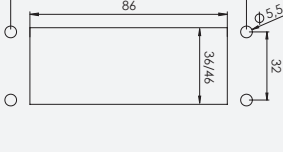
KEL-DPZ

Cable entry plates

KEL-DPZ 16



IP66

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 16 11	36 x 86 mm	11 x 7.5 - 12 mm	43815	10
		KEL-DPZ 16 11 with threaded bushings M4	36 x 86 mm	11 x 7.5 - 12 mm	43815.400	10
		KEL-DPZ 16 14	36 x 86 mm	5 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 9 - 16.2 mm	43816	10
		KEL-DPZ 16 14 with threaded bushings M4	36 x 86 mm	5 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 9 - 16.2 mm	43816.400	10
		KEL-DPZ 16 20	36 x 86 mm	11 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 7.5 - 12 mm	43817	10
		KEL-DPZ 16 20 with threaded bushings M4	36 x 86 mm	11 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 7.5 - 12 mm	43817.400	10
		KEL-DPZ 16 25	36 x 86 mm	16 x 3.2 - 6.5 mm 6 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43818	10
		KEL-DPZ 16 25 with threaded bushings M4	36 x 86 mm	16 x 3.2 - 6.5 mm 6 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43818.400	10
		KEL-DPZ 16 34	36 x 86 mm	34 x 3.2 - 6.5 mm	43819	10
		KEL-DPZ 16 34 with threaded bushings M4	36 x 86 mm	34 x 3.2 - 6.5 mm	43819.400	10



The KEL-DPZ series is also available as a cleanroom version, see from page 283.

KEL-DPZ

Cable entry plates

KEL-DPZ 10



2.1

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 10 8	65 x 36 mm	8 x 7.5 - 12 mm	43800	10
		KEL-DPZ 10 8 with threaded bushings M4	65 x 36 mm	8 x 7.5 - 12 mm	43800.400	10
		KEL-DPZ 10 14	65 x 36 mm	14 x 5 - 10.2 mm	43801	10
		KEL-DPZ 10 14 with threaded bushings M4	65 x 36 mm	14 x 5 - 10.2 mm	43801.400	10
		KEL-DPZ 10 15	65 x 36 mm	5 x 3.2 - 6.5 mm 10 x 5 - 10.2 mm	43802	10
		KEL-DPZ 10 15 with threaded bushings M4	65 x 36 mm	5 x 3.2 - 6.5 mm 10 x 5 - 10.2 mm	43802.400	10
		KEL-DPZ 10 16	65 x 36 mm	9 x 3.2 - 6.5 mm 4 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43803	10
		KEL-DPZ 10 16 with threaded bushings M4	65 x 36 mm	9 x 3.2 - 6.5 mm 4 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43803.400	10
		KEL-DPZ 10 26	65 x 36 mm	26 x 3.2 - 6.5 mm	43804	10
		KEL-DPZ 10 26 with threaded bushings M4	65 x 36 mm	26 x 3.2 - 6.5 mm	43804.400	10

KEL-DPZ

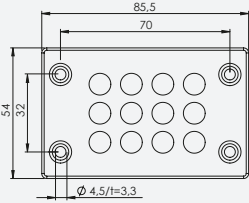
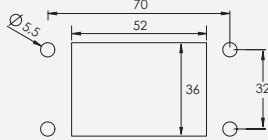
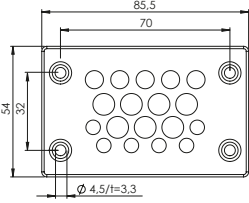
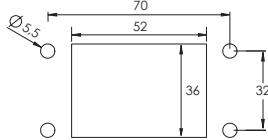
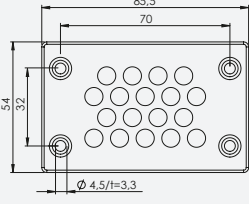
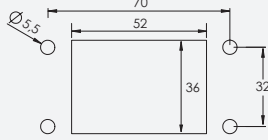
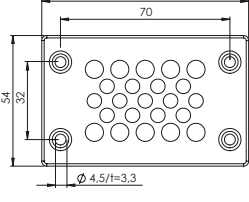
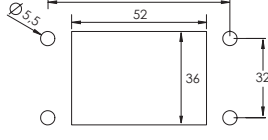
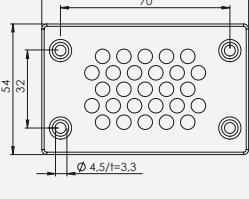
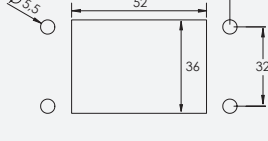
Cable entry plates

KEL-DPZ 6



IP66

2.1

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 6 12	52 x 36 mm	12 x 4.5 - 8.0 mm	43809	10
		KEL-DPZ 6 18-1	52 x 36 mm	6 x 2.5 - 5.0 mm 5 x 3.2 - 6.5 mm 7 x 4.5 - 8.0 mm	43811	10
		KEL-DPZ 6 18	52 x 36 mm	18 x 3.2 - 6.5 mm	43812	10
		KEL-DPZ 6 23	52 x 36 mm	13 x 2.5 - 5.0 mm 10 x 3.2 - 6.5 mm	43813	10
		KEL-DPZ 6 27	52 x 36 mm	27 x 2.5 - 5.0 mm	43814	10



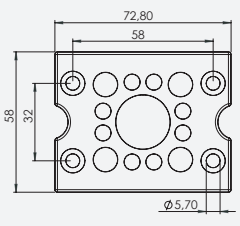
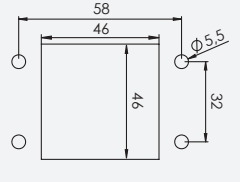
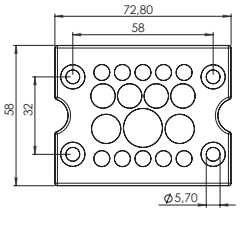
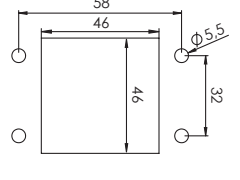
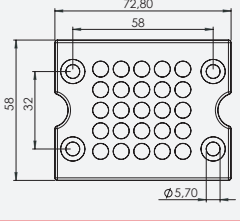
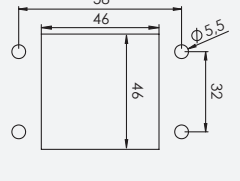
KEL-DPZ

Cable entry plates

KEL-DPZ-B



2.1

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ-B 13	46 x 46 mm	8× 3.2 - 6.5 mm 4× 5 - 10.2 mm 1× 16 - 22 mm	■ 43794 ■ 50794	10
		KEL-DPZ-B 13 with threaded bushings M4	46 x 46 mm	8× 3.2 - 6.5 mm 4× 5 - 10.2 mm 1× 16 - 22 mm	■ 43794.400 ■ 50794.400	10
		KEL-DPZ-B 17	46 x 46 mm	10× 3.2 - 6.5 mm 4× 5 - 10.2 mm 2× 7.5 - 12 mm 1× 9 - 16.2 mm	■ 43796 ■ 50796	10
		KEL-DPZ-B 17 with threaded bushings M4	46 x 46 mm	10× 3.2 - 6.5 mm 4× 5 - 10.2 mm 2× 7.5 - 12 mm 1× 9 - 16.2 mm	■ 43796.400 ■ 50796.400	10
		KEL-DPZ-B 25	46 x 46 mm	25× 3.2 - 6.5 mm	■ 43798 ■ 50798	10
		KEL-DPZ-B 25 with threaded bushings M4	46 x 46 mm	25× 3.2 - 6.5 mm	■ 43798.400 ■ 50798.400	10



The KEL-DPZ series is also available as a cleanroom version, see from page 283.

KEL-DPZ

Cable entry plates

KEL-DPZ-E, KEL-DPZ-KX/KL



Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ-E 112 7	18 x 112 mm	7× 7.5 - 12 mm	■ 43780 ■ 50780	10
		KEL-DPZ-E 112 7 with threaded bushings M4	18 x 112 mm	7× 7.5 - 12 mm	■ 43780.400 ■ 50780.400	10
		KEL-DPZ-E 112 21	18 x 112 mm	21× 3.2 - 6.5 mm	■ 43790 ■ 50790	10
		KEL-DPZ-E 112 21 with threaded bushings M4	18 x 112 mm	21× 3.2 - 6.5 mm	■ 43790.400 ■ 50790.400	10
		KEL-DPZ-KX/KL 72	62 x 192 mm	42× 3.2 - 6.5 mm 21× 5 - 10.2 mm 6× 9 - 16.2 mm 3× 16 - 22 mm	■ 43675.001 ■ 43675.101	1

2.1

The KEL-DPZ series is also available as a cleanroom version, see from page 283.

* Only valid for grey product types

Cable entry plates with IP66/IP68 rating KEL-DPZ round series

2.1 Product description

KEL-DPZ round cable entry plates are designed to route and seal cables without connectors or fibre optics (from 1.5 mm to 22 mm in diameter) in limited space.

The assembly of the KEL-DPZ round with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane, push the cables through. The KEL-DPZ round provides strain relief and protection IP66/IP68/UL Type 4X.

The round versions of the KEL-DPZ series have a thread to fit in metric cut-outs from M25 to M63. Thus cut-outs for metric cable glands can be used. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

Advantages & benefits

- Dual sealing of cables acc. to IP66/IP68/up to UL type 4X
- Quick and easy tool-free assembly
- High cable density
- High strain relief
- Suitable for metric cut-outs
- Polyamide locknuts are included in the shipment
- Hygienic design – free of dirt-collecting recesses
- Available as an FDA compliant version

Specifications

Material	Thread frame: Polyamide (PA) Sealing plate: Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP65/IP66/IP67/IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dim.	Metric sizes
Thread length	14 mm
Plate depth	8 mm

Accessories

ST-B Plugs	123
FP Flanged plates	236 - 245
MP Module plates	230 - 231

i This product range is also available as a KEL-DPZ-HD version for the food sector, see pages 128 – 129. The KEL-DPZ round is also available as a cleanroom version, see from page 286.



Membrane on front



Conical shape on back provides additional sealing and strain relief



Also available in black



KEL-DPZ 25



IP66

IP68

UL TYPE 12

UL TYPE 4X



ISO 4892-2A

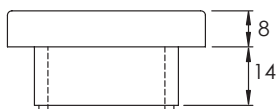
ECOLAB certified

FDA

Made in Germany

icotek®

KEL-DPZ round Cable entry plates



Type	Order No.	Number of cables	Thread metric	Thread length	External diameter	Mounting height	PU
KEL-DPZ 25 3	■ 43736	2x 3.2 - 5.2 mm	M25 × 1.5	14 mm	39 mm	8 mm	10
	■ 50736	1x 3.2 - 6.5 mm					
KEL-DPZ 25 4	■ 43737	4x 3.2 - 5.2 mm	M25 × 1.5	14 mm	39 mm	8 mm	10
	■ 50737						
KEL-DPZ 32 4	■ 43732	3x 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50732	1x 7.2 - 12.5 mm					
KEL-DPZ 32 4-2	■ 43733	4x 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50733						
KEL-DPZ 32 7	■ 43734	7x 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50734						
KEL-DPZ 40 8	■ 43741	4x 3.2 - 6.5 mm	M40 × 1.5	14 mm	52 mm	8 mm	10
	■ 50741	4x 5 - 10.2 mm					
KEL-DPZ 50 8	■ 43750	5x 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50750	3x 7.2 - 12.5 mm					
KEL-DPZ 50 10	■ 43751	7x 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50751	2x 5 - 10.2 mm 1x 16 - 22.2 mm					
KEL-DPZ 50 12	■ 43752	4x 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50752	8x 5 - 10.2 mm					
KEL-DPZ 50 19	■ 43758	19x 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50758						
KEL-DPZ 50 78	■ 43756	76x 1.5 - 2.6 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50756	2x 2.5 - 5 mm					
KEL-DPZ 63 9	■ 43760	1x 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50760	3x 5 - 10.2 mm 4x 9 - 16.2 mm 1x 16 - 22.2 mm					
KEL-DPZ 63 13	■ 43761	4x 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50761	4x 5 - 10.2 mm 5x 9 - 16.2 mm					
KEL-DPZ 63 14	■ 43762	14x 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50762						
KEL-DPZ 63 35	■ 43763	35x 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50763						

* Only valid for grey product types

Cable entry plates for snap-in or screw-in assembly with IP65/IP66/IP68 rating KEL-DPZ-CLICK round series

2.1 Product description

The round cable entry plates KEL-DPZ-CLICK are designed to route and seal cables without connectors or fibre optics (from 1.5 mm to 22 mm in diameter) in limited space.

The new variant of the proven cable entry plate KEL-DPZ is snapped into the cut-out directly from the front. This significantly reduces the assembly time. Alternatively, the new variant can be fastened with a lock nut to achieve protection class IP66/IP68. The KEL-DPZ-CLICK series have a thread to fit in metric cut-outs from M25 to M63. Thus cut-outs for metric cable glands can be used. A lock nut is not included in the shipment.

Snap-in assembly:

For wall thickness 1 – 2.5 mm
Protection class IP65

Screwed in place with a lock nut:

For max. wall thickness 11 mm
Protection class IP66/IP68

Advantages

- Easy assembly directly from the front
- Offers two mounting types:
Snap in (IP65) and Screw in (up to IP68)
- Certified protection IP65/IP66/IP68 (acc. to EN 60529)
- High cable density
- Automatic sealing and strain relief for the cable
- Suitable for metric cut-outs M25 – M63
- Snap-in assembly: For wall thickness 1.0 – 2.5 mm
- Screw assembly: For wall thickness up to 11 mm

Specifications

Material	Polyamid, Elastomere
IP rating	Snap-in: IP65 Screwed in place with lock nut: IP65/IP66/IP68
Flame class	UL 94 V-0, self-extinguishing
Temperature	-40°C to +100°C (static)
Colour	■ grey (similar to RAL 7035)
Properties	Halogen free, silicone free
Mounting height	8 mm

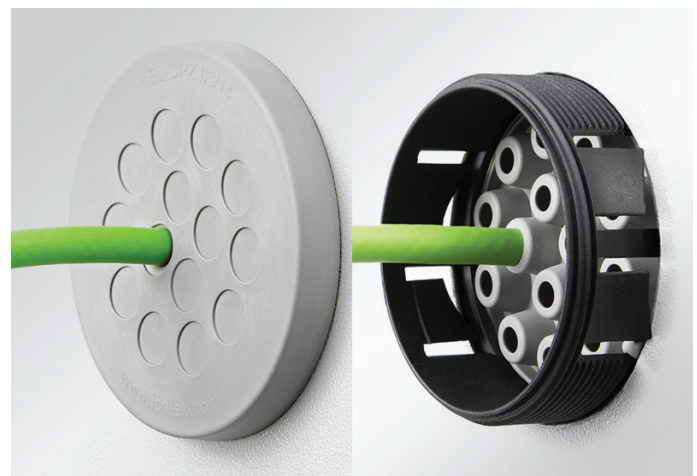
Accessories

KGM locknuts 250

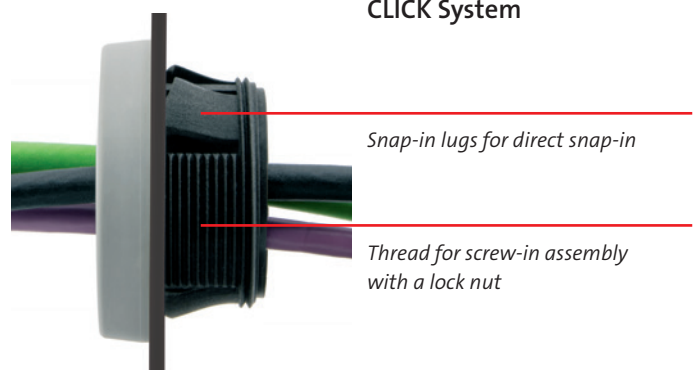


Mounting type 1:
Snap into the cut-out
For wall thickness 1 – 2.5 mm

Mounting type 2:
Screwed in place with a lock nut
For max. wall thickness 11 mm



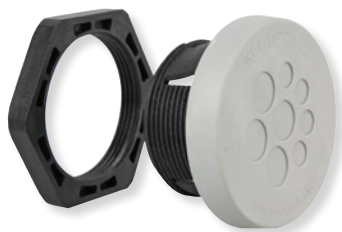
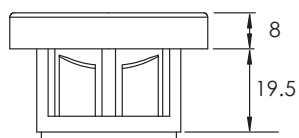
CLICK System



KEL-DPZ-CLICK

Cable entry plates

for snap-in or screw-in assembly



Type	Order No.	Number of cables	Thread metric	Thread length	External diameter	Mounting height	PU
KEL-DPZ-CLICK 25 3	■ 44050	2× 3.2 – 5.2 mm 1× 3.2 – 6.5 mm	M25 × 1.5	19.5 mm	39 mm	8 mm	10
KEL-DPZ-CLICK 25 4	■ 44051	4× 3.2 – 5.2 mm	M25 × 1.5	19.5 mm	39 mm	8 mm	10
KEL-DPZ-CLICK 32 4	■ 44052	3× 3.2 – 6.5 mm 1× 7.2 – 12.5 mm	M32 × 1.5	19.5 mm	44 mm	8 mm	10
KEL-DPZ-CLICK 32 4-2	■ 44053	4× 5 – 9.5 mm	M32 × 1.5	19.5 mm	44 mm	8 mm	10
KEL-DPZ-CLICK 32 7	■ 44054	7× 3.2 – 6.5 mm	M32 × 1.5	19.5 mm	44 mm	8 mm	10
KEL-DPZ-CLICK 40 8	■ 44055	4× 3.2 – 6.5 mm 4× 5 – 10.2 mm	M40 × 1.5	19.5 mm	52 mm	8 mm	10
KEL-DPZ-CLICK 50 8	■ 44056	5× 5 – 10.2 mm 3× 7.2 – 12.5 mm	M50 × 1.5	19.5 mm	62 mm	8 mm	10
KEL-DPZ-CLICK 50 10	■ 44057	7× 3.2 – 6.5 mm 2× 5 – 10.2 mm 1× 16 – 22.2 mm	M50 × 1.5	19.5 mm	62 mm	8 mm	10
KEL-DPZ-CLICK 50 12	■ 44058	4× 3.2 – 6.5 mm 8× 5 – 10.2 mm	M50 × 1.5	19.5 mm	62 mm	8 mm	10
KEL-DPZ-CLICK 50 19	■ 44059	19× 3.2 – 6.5 mm	M50 × 1.5	19.5 mm	62 mm	8 mm	10
KEL-DPZ-CLICK 50 78	■ 44060	76× 1.5 – 2.6 mm 2× 2.5 – 5 mm	M50 × 1.5	19.5 mm	62 mm	8 mm	10
KEL-DPZ-CLICK 63 9	■ 44061	1× 3.2 – 6.5 mm 3× 5 – 10.2 mm 4× 9 – 16.2 mm 1× 16 – 22.2 mm	M63 × 1.5	19.5 mm	75 mm	8 mm	10
KEL-DPZ-CLICK 63 13	■ 44062	4× 3.2 – 6.5 mm 4× 5 – 10.2 mm 5× 9 – 16.2 mm	M63 × 1.5	19.5 mm	75 mm	8 mm	10
KEL-DPZ-CLICK 63 14	■ 44063	14× 5 – 10.2 mm	M63 × 1.5	19.5 mm	75 mm	8 mm	10
KEL-DPZ-CLICK 63 35	■ 44064	35× 3.2 – 6.5 mm	M63 × 1.5	19.5 mm	75 mm	8 mm	10

Cable entry plates with IP64 rating KEL-DP series

2.1 Product description

KEL-DP entry plates are designed for routing cables without connectors, hoses or fibre optics in limited space.

The KEL-DP products are an easy to assemble and cost saving alternative to traditional cable glands. Simply make a small hole in the thin membrane and push the cables through. The KEL-DP provides protection IP64/UL type 12.

The KEL-DP matches exactly the cut-out dimensions of 6-, 16- and 24-pin standard industrial connectors. The very compact size KEL-DP-E is designed for routing cables in very small space. Through a cut-out of only 18 x 112 mm, up to 21 cables can be easily routed and sealed. A special rib ensures a centred fit in the cut-outs. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

Advantages & benefits

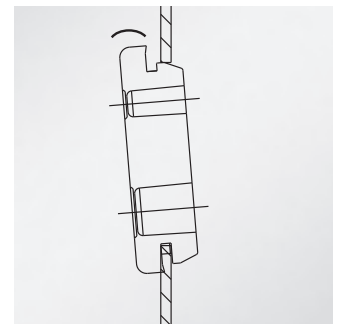
- Fast and easy assembly, no tools required
- Very good strain relief on the cable bundle
- Very high cable density
- Cost-effective
- Hygienic design – free of dirt-collecting recesses
- For wall thickness 1.5 - 4 mm

Specifications

Material	Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP64 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	5 mm
Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm

Accessories

ST-B Plugs	123
FP Flanged plates	236 - 245



Fastening



Also available in black

KEL-DP

Cable entry plates

KEL-DP 24



2.1

Description	Cut-out	Type	Cut-out mm	Number of cables	Order No. Type A	Order No. Type B	PU
		KEL-DP 24 12	112 x 36 mm	12× max. 15 mm	■ 43508 ■ 50508	–	10
		KEL-DP 24 14	112 x 36 mm	14× max. 12.1 mm	■ 43512 ■ 50512	■ 43522 ■ 50522	10
		KEL-DP 24 17	112 x 36 mm	5× max. 10.5 mm 12× max. 12.6 mm	■ 43514 ■ 50514	■ 43523 ■ 50523	10
		KEL-DP 24 18	112 x 36 mm	4× max. 6.5 mm 5× max. 10.5 mm 5× max. 12.6 mm 4× max. 16.1 mm	■ 43515 ■ 50515	■ 43528 ■ 50528	10
		KEL-DP 24 19	112 x 36 mm	12× max. 6.5 mm 7× max. 12.1 mm	■ 43516 ■ 50516	■ 43524 ■ 50524	10
		KEL-DP 24 26	112 x 36 mm	16× max. 6.5 mm 4× max. 12.1 mm 4× max. 16.1 mm 2× ASI cables	■ 43518 ■ 50518	■ 43525 ■ 50525	10
		KEL-DP 24 42	112 x 36 mm	1× max. 4.7 mm 12× max. 5 mm 17× max. 6.4 mm 12× max. 7.2 mm	■ 43511 ■ 50511	■ 43521 ■ 50521	10
		KEL-DP 24 48	112 x 36 mm	48× max. 6.5 mm	■ 43519 ■ 50519	■ 43526 ■ 50526	10
		KEL-DP 24 50	112 x 36 mm	33× max. 5.3 mm 9× max. 6.4 mm 8× max. 8.3 mm	■ 43520 ■ 50520	■ 43527 ■ 50527	10

* Only valid for grey product types

KEL-DP

Cable entry plates

KEL-DP 16



2.1

Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP 16 10	86 x 36 mm	10 x max. 12.1mm	43460	10
		KEL-DP 16 11	86 x 36 mm	3 x max. 10.5 mm 8 x max. 12.6 mm	43461	10
		KEL-DP 16 20	86 x 36 mm	20 x max. 8.3 mm	43462	10
		KEL-DP 16 22	86 x 36 mm	13 x max. 6.5 mm 4 x max. 8.3 mm 5 x max. 12.1 mm	43463	10
		KEL-DP 16 23	86 x 36 mm	18 x max. 6.5 mm 5 x max. 12.1 mm	43464	10
		KEL-DP 16 26	86 x 36 mm	19 x max. 6.5 mm 7 x max. 8.3 mm	43465	10



KEL-DP 16

KEL-DP

Cable entry plates

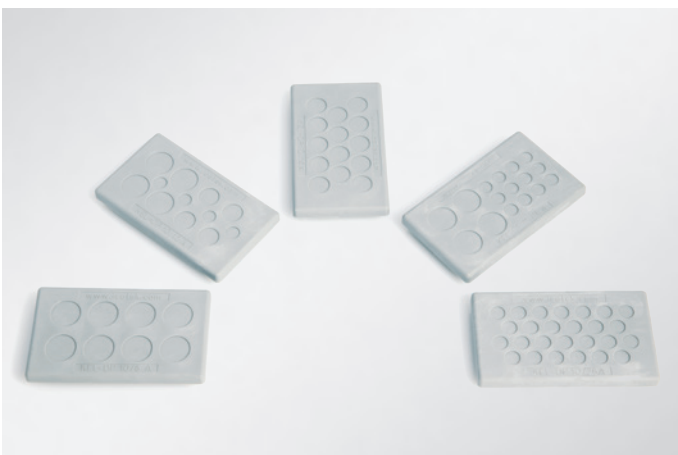
KEL-DP 10



IP64

Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP 10 8	65 x 36 mm	8 x max. 12.6 mm	43466	10
		KEL-DP 10 12	65 x 36 mm	4 x max. 6.5 mm 4 x max. 8.3 mm 4 x max. 12.6 mm	43467	10
		KEL-DP 10 14	65 x 36 mm	14 x max. 8.3 mm	43468	10
		KEL-DP 10 16	65 x 36 mm	4 x max. 6.5 mm 12 x max. 12.6 mm	43469	10
		KEL-DP 10 26	65 x 36 mm	26 x max. 6.5 mm	43470	10

2.1



KEL-DP 10

KEL-DP

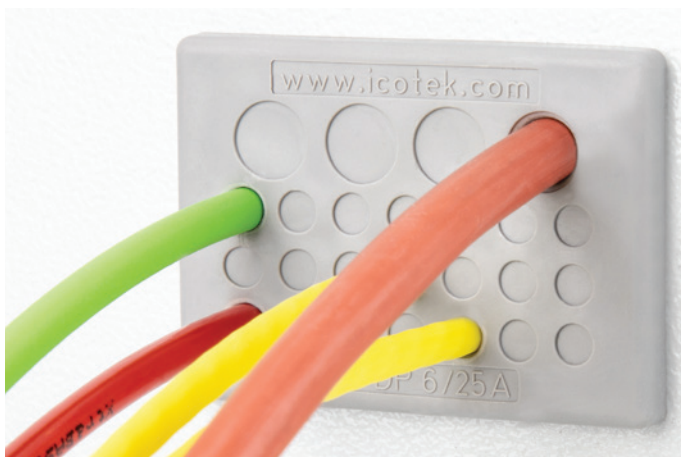
Cable entry plates

KEL-DP 6



2.1

Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP 6 6	52 x 36 mm	6 x max. 12.1 mm	43450	10
		KEL-DP 6 12	52 x 36 mm	8 x max. 6.5 mm 2 x max. 12.6 mm 2 x max. 16.1 mm	43451	10
		KEL-DP 6 14	52 x 36 mm	10 x max. 6.5 mm 4 x max. 10.5 mm	43452	10
		KEL-DP 6 25	52 x 36 mm	21 x max. 5.0 mm 4 x max. 8.3 mm	43453	10



KEL-DP 6

KEL-DP

Cable entry plates

KEL-DP-E



IP64

2.1

Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP-E 46 7	46 × 18 mm	2× max. 6.5 mm 5× max. 8.3 mm	■ 43585 ■ 50585	10
		KEL-DP-E 46 9	46 × 18 mm	8× max. 6.5 mm 1× max. 12.1 mm	■ 43587 ■ 50587	10
		KEL-DP-E 86 13	85 × 18 mm	2× max. 6.5 mm 11× max. 8.3 mm	■ 43581 ■ 50581	10
		KEL-DP-E 86 17	85 × 18 mm	16× max. 6.5 mm 1× max. 12.1 mm	■ 43583 ■ 50583	10
		KEL-DP-E 112 16	112 × 18 mm	4× max. 6.5 mm 11× max. 8.3 mm 1× max. 12.1 mm	■ 43576 ■ 50576	10
		KEL-DP-E 112 21	112 × 18 mm	16× max. 6.5 mm 4× max. 8.3 mm 1× max. 12.1 mm	■ 43578 ■ 50578	10
		KEL-DP-S 69 8	69 × 10 mm Edge radii R2	8× max. 7.5 mm	■ 43591 ■ 50591	10

Cable entry plates with IP65 rating KEL-DP round

2.1 Product description

KEL-DP entry plates are designed for routing cables without connectors, hoses or fibre optics in limited space.

The KEL-DP products are an easy to assemble and cost saving alternative to traditional cable glands. Simply make a small hole in the thin membrane and push the cables through. The KEL-DP round provides protection IP65/UL type 12.

The round version of the KEL-DP fits perfectly into metric cut-outs M20 | M25 | M32 | M40 | M50. A special rib ensures a centred fit in the cut-outs.

ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

Advantages & benefits

- Fast and easy assembly, no tools required
- High cable density
- Very good strain relief on the cable bundle
- Cost-effective
- For wall thickness 1.5 - 4 mm
- Hygienic design – free of dirt-collecting recesses

Specifications

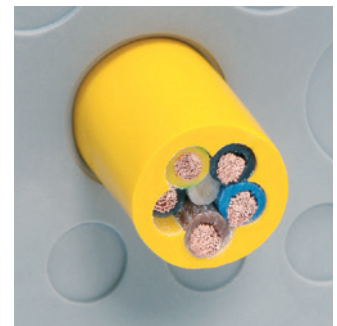
Material	Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP65 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimensions	Metric sizes
Plate depth	5 mm
Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm

Accessories

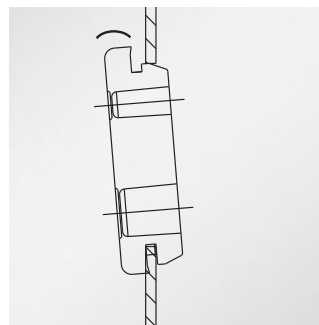
ST-B Plugs	123
FP Flange plates	236 - 245



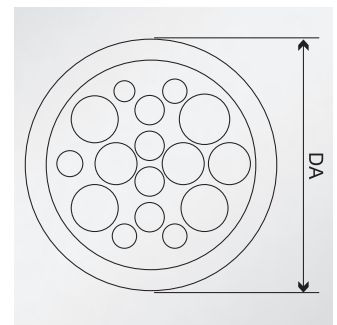
Also available in black



Membrane on front



Fastening



Special fixing ribs ensure a centred fit

KEL-DP round Cable entry plates



2.1

Type	Order No. Typ A	Order No. Typ B	Number of cables	Cut-out	External diameter DA	PU
KEL-DP 20 4	■ 43572	–	4x max. 5.2 mm	∅ 20 mm	27 mm	10
KEL-DP 20 4-1	NEW ■ 43575	–	2x max. 4.5 2x max. 8.0	∅ 20 mm	27 mm	10
KEL-DP 20 5	■ 43573	–	2x max. 3.6 mm 2x max. 4.6 mm 1x max. 10.6 mm	∅ 20 mm	27 mm	10
KEL-DP 20 9	■ 43574	–	4x max. 3.6 mm 5x max. 4.6 mm	∅ 20 mm	27 mm	10
KEL-DP 25 4	■ 43533 ■ 50533	NEW ■ 43535	4x max. 8 mm	∅ 25 mm	32 mm	10
KEL-DP 25 6	■ 43531 ■ 50531	–	4x max. 5.2 mm 2x max. 9.4 mm	∅ 25 mm	32 mm	10
KEL-DP 25 7	■ 43534	–	7x max. 5.2 mm	∅ 25 mm	32 mm	10
KEL-DP 32 7	■ 43592	■ 43596	7x max. 8.0 mm	∅ 32 mm	38 mm	10
KEL-DP 32 10	■ 43532 ■ 50532	■ 43560 ■ 50560	6x max. 5.2 mm 2x max. 6.4 mm 2x max. 9.4 mm	∅ 32 mm	38 mm	10
KEL-DP 32 10-2	■ 43593	■ 43597	10x max. 6.4 mm	∅ 32 mm	38 mm	10
KEL-DP 32 11	■ 43594	■ 43598	9x max. 5.2 mm 2x max. 8.0 mm	∅ 32 mm	38 mm	10
KEL-DP 32 13	■ 43595	■ 43599	13x max. 5.2 mm	∅ 32 mm	38 mm	10

KEL-DP round

Cable entry plates

IP65



2.1

Type	Order No. Type A	Order No. Type B	Number of cables	Cut-out	External diameter DA	PU
KEL-DP 40 9	■ 43536	■ 43561	8× max. 9.5 mm 1× max. 11.3 mm	∅ 40 mm	50 mm	10
KEL-DP 40 16	■ 43537	■ 43563	2× max. 5.3 mm 10× max. 6.3 mm 2× max. 9.5 mm 2× max. 11.3 mm	∅ 40 mm	50 mm	10
KEL-DP 40 17	■ 43538	■ 43565	1× max. 4 mm 16× max. 7.2 mm	∅ 40 mm	50 mm	10
KEL-DP 50 9	■ 43554 ■ 50554	■ 43568 ■ 50568	5× max. 7 mm 4× max. 18 mm	∅ 50 mm	60 mm	10
KEL-DP 50 11	■ 43555 ■ 50555	■ 43569 ■ 50569	7× max. 7.2 mm 3× max. 11.2 mm 1× max. 22.5 mm	∅ 50 mm	60 mm	10
KEL-DP 50 12	■ 43551 ■ 50551	■ 43562 ■ 50562	10× max. 9.2 mm 2× max. 11.2 mm	∅ 50 mm	60 mm	10
KEL-DP 50 16	■ 43550 ■ 50550	■ 43564 ■ 50564	4× max. 5.3 mm 5× max. 6.3 mm 3× max. 9.5 mm 4× max. 11.3 mm	∅ 50 mm	60 mm	10
KEL-DP 50 18	■ 43553 ■ 50553	■ 43567 ■ 50567	2× max. 4 mm 2× max. 6 mm 4× max. 7.2 mm 5× max. 9.4 mm 5× max. 12 mm	∅ 50 mm	60 mm	10
KEL-DP 50 20	■ 43552 ■ 50552	■ 43566 ■ 50566	16× max. 6.3 mm 4× max. 9.3 mm	∅ 50 mm	60 mm	10
KEL-DP 50 35	■ 43556 ■ 50556	■ 43570 ■ 50570	35× max. 5.2 mm	∅ 50 mm	60 mm	10

ST-B

Plugs for membranes



Type	Order No.	Diameter D1	Diameter D2	Length L	PU
ST-B 6	42806	8 mm	6 mm	16 mm	25
ST-B 10	42810	12 mm	10 mm	16 mm	25
ST-B 12	42812	15 mm	12 mm	16 mm	25
ST-B 16	42816	19 mm	16 mm	16 mm	25
ST-B 22	42822	25 mm	22 mm	21 mm	25
Assortment ST-B Plugs	42801	5× ST-B 6 5× ST-B 10 2× ST-B 12 1× ST-B 16 1× ST-B 22			

Product description

Plugs ST-B are used to seal already pierced membranes in various cable entry plates (KEL-DPU, KEL-DPZ, KEL-DP, KEL-QTA-DP) and DT grommets.

Perfect for applications where cables have been removed.

The IP rating of the cable entry plate remains.

Advantages & benefits

- Sealing of pierced cable entry membranes which are no longer in use

Specifications

Material	Polyamide (PA), white
Flame class	UL 94 V-0, self-extinguishing
Temperature	-40°C to +120°C
Properties	Halogen-free, silicone-free

Compatible with

KEL-DPU Cable entry plates	101
KEL-DPZ Cable entry plates	102 - 113
KEL-DP Cable entry plates	114 - 122
KT-DT Cable entry grommets	54
KEL-QTA-DP Cable entry plates	78



Cover plugs

for cable entry plates



2.1 Product description

The openings at the fastening points of the cable entry plates can be closed with the cover plugs.

The cover plugs can be used with the products of the KEL-DPZ series. They are available in black and grey.

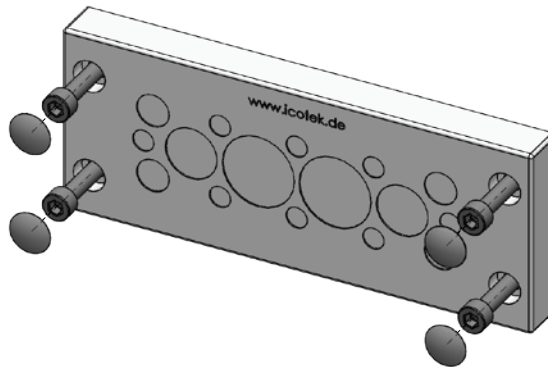
Advantages

- Simple closing of the openings at the fastening points of the KEL-DPZ
- Smooth finish on the frame surface
- No dirt recesses

Specifications

Material	PE (Polyethylen)
Temperature	Continuous operating temperature +70°C
Properties	Higher chemical resistance

Description	Order No.	PU
Cover plugs B black for M5 DIN 912 Screws, for KEL-DPZ	■ 99200	40
Cover plugs C grey for M5 DIN 912 Screws, for KEL-DPZ	■ 99201	40



When fastening from the front by means of screws, the openings at the screw heads can be closed with the **cover plugs B** in black (order no. 99200) or **cover plugs C** in grey (order no. 99201). The cover plugs can only be used for M5 DIN 912 screws.

Made in
Germany

Free
product samples

Customer
service

No minimum
order value

Custom
projects

Global
shipping

Certified
products

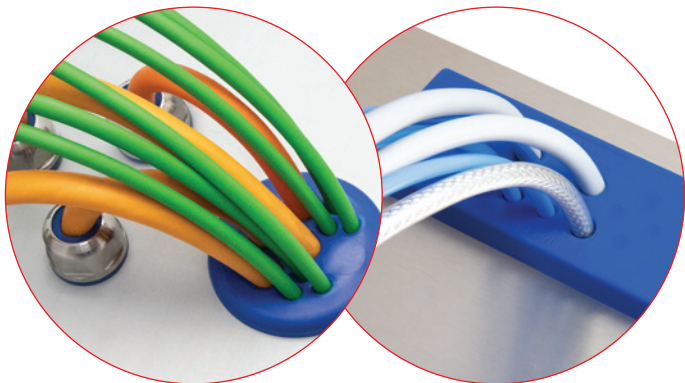
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2.2 Cable entry plates for the food industry – Hygienic Design Line

NEW	HYGIENIC DESIGN LINE	1935/2004/EG	EU VO. 10/2011	FDA	UL TYPE 4X	UL TYPE 12	ECOLAB certified	EN ISO 14644	up to IP68	PNEUMATICS	RoHS compliant	Made in Germany	+80°C -40°C	3.2–22.2mm
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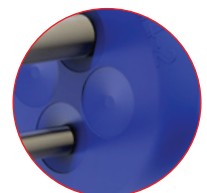
2.2



High cable density



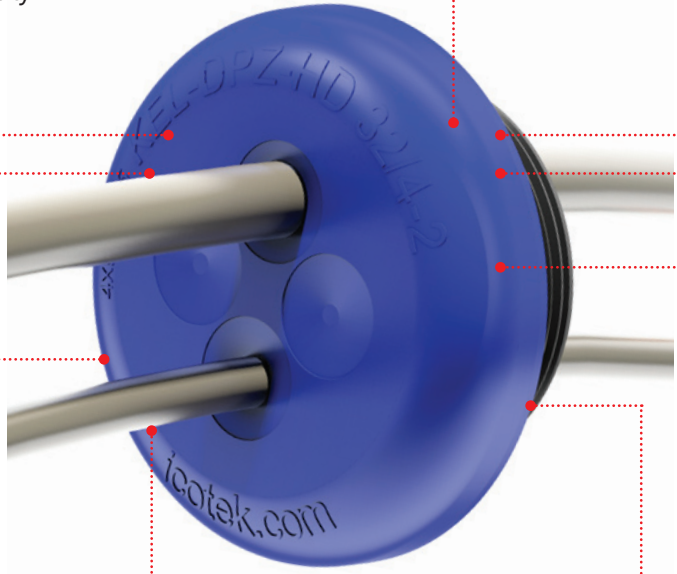
Fast and easy assembly



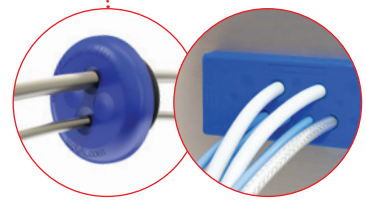
FDA compliant, food approval acc. to 1935/2004/EG and (EU) 10/2011, Ecolab certified

Signal blue colour (similar to Signal Blue RAL 5005)

Very smooth surface

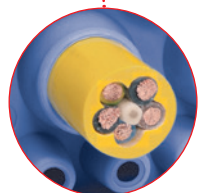
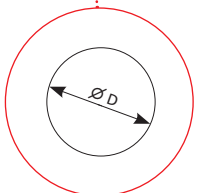


Compact, space-saving design

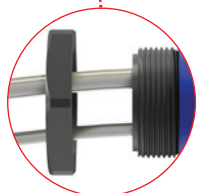


For metric cut-outs

IP65 to IP68 rated protection, double cable sealing on front and back



Flexible clamping range, up to 7 mm



The fixation is very simple with the lock nut.

Chapter content

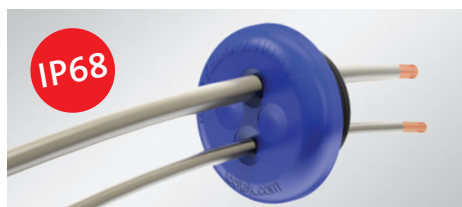
NEW ▶



Cable entry plates
with high strain relief
Hygienic Design Line

KEL-DPU-HD

128 – 129



Cable entry plates, round
Hygienic Design Line

KEL-DPZ-HD

130 – 131



Plugs for cable entry plates
Hygienic Design Line

ST-B-HD | ST-B-HDD

132



Detectable cable ties
and holders for cable ties
Hygienic Design Line

KB-HDD | KBH-HDD

133

Heavy-duty cable entry plates with high strain relief KEL-DPU-HD *Hygienic Design Line*

Product description

The new cable entry plates KEL-DPU-HD have been specially developed for installation in food processing and packaging machines. During the development according to the Hygienic Design guidelines, care was taken to ensure that the visible side of the cable entry plate are free of dirt-collecting recesses. The surface was kept very smooth. The outer contour has a radius of 6 mm instead of the required 3 mm. In addition, the KEL-DPU-HD uses an FDA-compliant elastomer in accordance with food approval 1935/2004/EG and (EU) 10/2011. The signal colour blue ensures a clear visual colour recognition.

KEL-DPU-HD entry plates are designed to route and seal cables without connectors (from 3.2 mm to 20.5 mm in diameter) in limited space with IP66/IP68**/up to UL type 4X ratings. The KEL-DPU is particularly characterised by its solid robust frame and the increased strain relief of the routed cables.

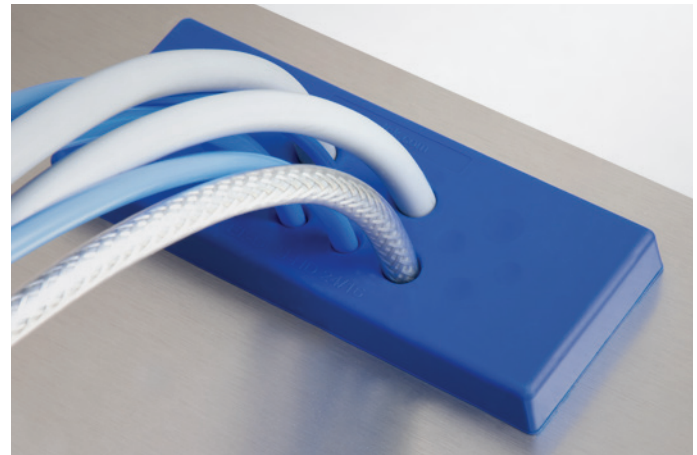
The KEL-DPU 24 matches exactly the cut-out dimensions of 24-pin standard industrial connectors. The cable entry plate is mounted either by screwing it to the inside of the enclosure or by snapping it into the cut-out.

Advantages

- Elastomer of the cable entry plate made of material according to 1935/2004/EG, (EU) 10/2011
- FDA compliant
- Developed according to hygienic design guidelines
- Hygienic design – free of dirt-collecting recesses
- Very flat design, very smooth surface
- Dual sealing of cables (IP66/IP68**)
- High strength and stability
- High strain relief
- Fast and easy assembly
- Very high cable density
- Cable diameter 3.2 – 20.5 mm
- Reproducible cleaning process
- Very low moisture absorption
- High resistance to aromatic solvents, oils, greases, mineral products

Specifications

Werkstoff	Frame: Polypropylene (PP), sealing plate: Elastomer FDA compliant material Food approval acc. to 1935/2004/EG Food approval acc. to (EU) 10/2011
IP rating	IP65/IP66/IP67/IP68**
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +80°C
Properties	Halogen-free, silicone-free



** IP68 only when screw mounted

KEL-DPU-HD

Heavy-duty cable entry plates
with high strain relief

Hygienic Design Line

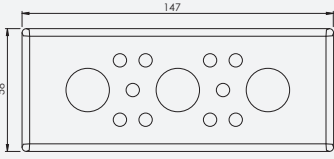
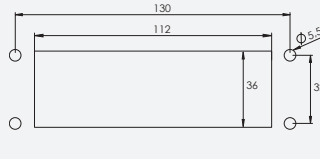
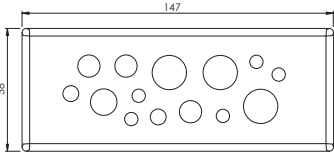
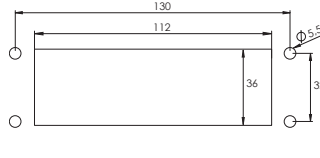
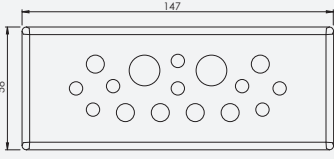
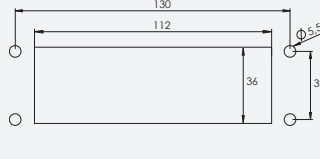
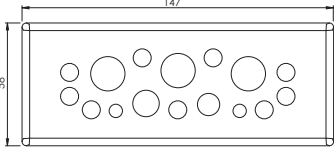
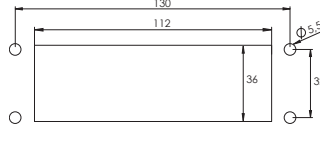
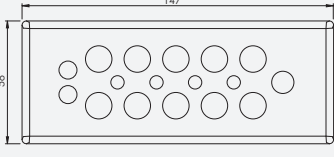
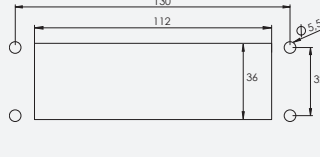
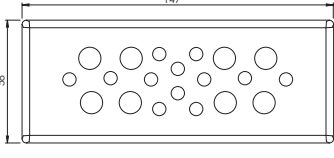
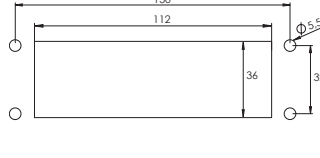
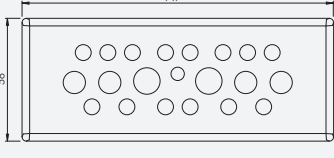
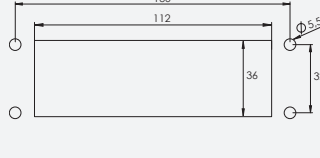
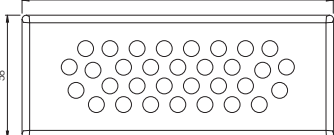
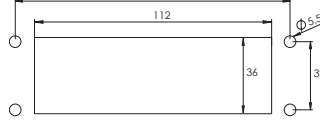


IP65

IP66

IP67

IP68

Description	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPU-HD 24 13 with threaded bushings M4	36 x 112 mm	10× 3.2 – 6.3 mm 3× 16 – 20.5 mm	73940	10
		KEL-DPU-HD 24 14 with threaded bushings M4	36 x 112 mm	5× 3.2 – 6.3 mm 2× 4 – 7.5 mm 3× 5.5 – 10.5 mm 1× 8 – 12.5 mm 3× 12 – 16.2 mm	73944	10
		KEL-DPU-HD 24 16 with threaded bushings M4	36 x 112 mm	8× 3.2 – 5.5 mm 6× 5 – 8.5 mm 2× 9.5 – 14.5 mm	73936	10
		KEL-DPU-HD 24 16-1 with threaded bushings M4	36 x 112 mm	2× 3.2 – 6.3 mm 9× 4 – 7.5 mm 1× 5.5 – 10.5 mm 1× 8 – 12.5 mm 3× 12 – 16.2 mm	73932	10
		KEL-DPU-HD 24 17 with threaded bushings M4	36 x 112 mm	4× 3.2 – 6.3 mm 2× 4 – 7.5 mm 1× 5.5 – 10.5 mm 10× 8 – 12.5 mm	73934	10
		KEL-DPU-HD 24 20 with threaded bushings M4	36 x 112 mm	12× 3.2 – 5.5 mm 8× 5 – 10.5 mm	73938	10
		KEL-DPU-HD 24 21 with threaded bushings M4	36 x 112 mm	1× 3.2 – 6.3 mm 14× 4 – 7.5 mm 4× 5.5 – 10.5 mm 2× 8 – 12.5 mm	73930	10
		KEL-DPU-HD 24 32 with threaded bushings M4	36 x 112 mm	32× 3.2 – 6.3 mm	73942	10

Cable entry plates

KEL-DPZ-HD

Hygienic Design Line

Product description

The cable entry plates KEL-DPZ-HD with metric thread from M32 to M63 have been developed for installation in food processing and packaging machines.

During the development according to the Hygienic Design guidelines, care was taken to ensure that the visible side of the cable entry plate are free of dirt-collecting recesses. The surface was kept very smooth. The outer contour has a radius of 6 mm instead of the required 3 mm. In addition, the KEL-DPZ-HD uses an FDA-compliant elastomer in accordance with food approval 1935/2004/EG and (EU) 10/2011. The signal colour blue ensures a clear visual colour recognition.

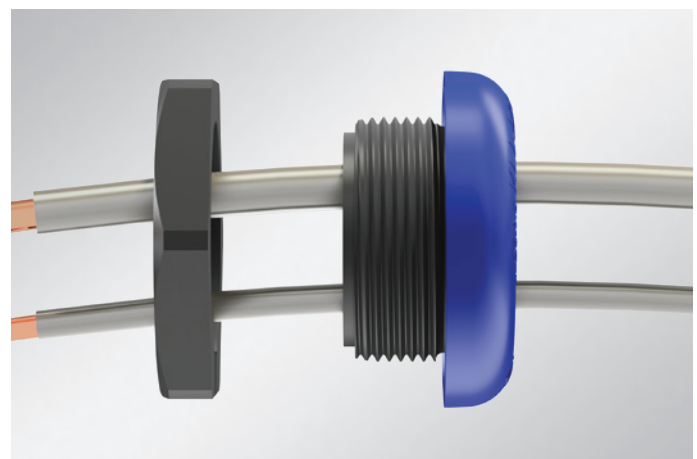
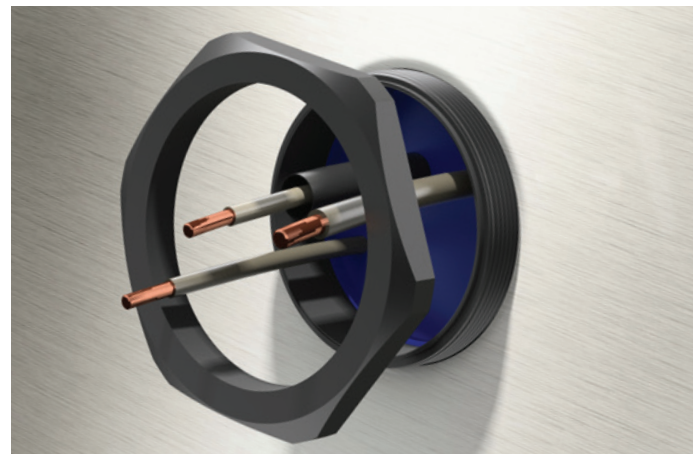
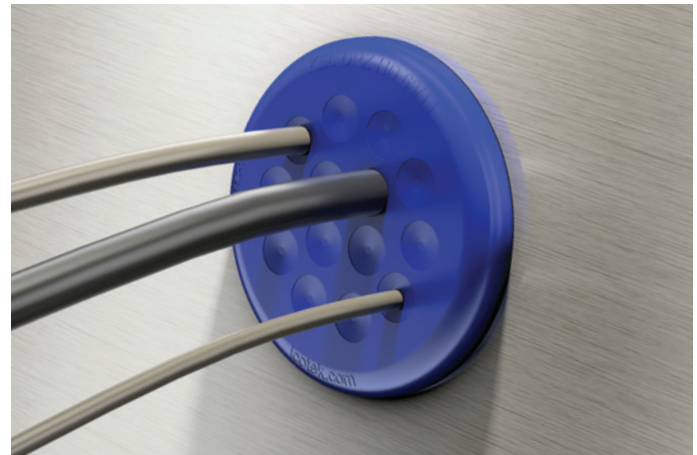
The cable entry plates are designed to route several cables and hoses with a diameter range of 3.2 mm to 22.2 mm and seal them acc. to IP65/66/67/68. A significant advantage over cable glands is the significantly higher cable density and the flexibility of the cable diameter range. The fixation is very simple with the lock nut. A lock nut is included in the shipment.

Advantages

- Elastomer of the cable entry plate made of material according to 1935/2004/EG , (EU) 10/2011
- FDA compliant
- Developed according to hygienic design guidelines
- Hygienic design – free of dirt-collecting recesses
- Ecolab certified
- Very flat design
- Very smooth surface (Ra 0.421 µm)
- Very fast assembly
- Cable diameter 3,2 – 22,2 mm
- Very large sealing areas and clamping areas
- High cable density
- High strain relief
- Dual sealing of cables (IP66/IP68)
- Suitable for metric cut-outs
- Reproducible cleaning process
- Very low moisture absorption
- High resistance to aromatic solvents, oils, greases, mineral products
- No corrosion possible because plastics have been processed
- Maintenance free

Specifications

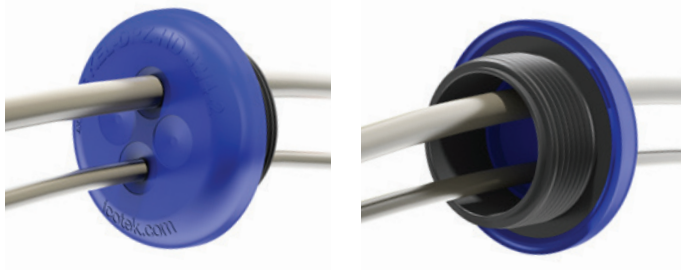
Material	Polyamide and elastomer FDA compliant material Food approval acc. to 1935/2004/EG Food approval acc. to (EU) 10/2011
IP protection	IP65/66/67/68
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +80°C
Properties	Halogen-free, silicone-free



The KEL-DPZ-HD is also available as a cleanroom version, see from page 287.

KEL-DPZ-HD

Cable entry plates
Hygienic Design Line



Type	Order No.	Number of cables	Thread metric	Thread length	External diameter	Mounting height	PU
KEL-DPZ-HD 32 4	70351	3× 3.2 - 6.5 mm 1× 7.2 - 12.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 32 4-2	70352	4× 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 32 7	70353	7× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 40 8	70354	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm	M40 × 1.5	14 mm	52 mm	8 mm	5
KEL-DPZ-HD 50 8	70355	5× 5 - 10.2 mm 3× 7.2 - 12.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 10	70356	7× 3.2 - 6.5 mm 2× 5 - 10.2 mm 1× 16 - 22.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 12	70357	4× 3.2 - 6.5 mm 8× 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 19	70358	19× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 63 9	70359	1× 3.2 - 6.5 mm 3× 5 - 10.2 mm 4× 9 - 16.2 mm 1× 16 - 22.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 13	70360	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm 5× 9 - 16.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 14	70361	14× 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 35	70362	35× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	5

ST-B-HD | ST-B-HDD

Plugs for cable entry plates

Hygienic Design Line



Product description

icotek offers plugs of the type ST-B-HD in the signal colour blue and in a detectable version of the type ST-B-HDD. The signal colour blue ensures a clear visual color recognition.

The ST-B-HDD plugs consist of a combination of polymer compound and metal particles. These can be sorted out using metal detectors, X-ray devices and visual detection systems.

The ST-B-HD and ST-B-HDD plugs are particularly suitable for pharmaceutical applications and for the food industry.

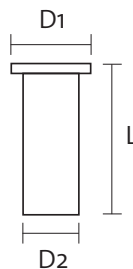
Advantages

- Sealing of pierced cable entry membranes which are no longer in use
- Blue colour for clear visual recognition
- ST-B-HDD: Detectable using metal detectors X-ray devices
- High resistance to aromatic solvents, oils, greases, mineral products

Specifications

Material	Polypropylene
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +120°C
Properties	Food approval acc. to 1935/2004/EG and (EU) 10/2011 ST-B-HDD: Detectable by V2A particles

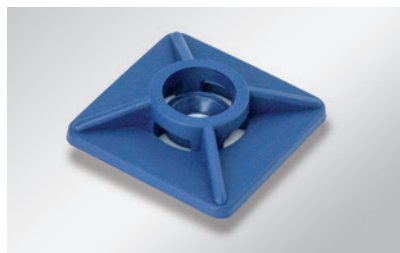
Type	Order No.	Diameter D1	Diameter D2	Length L	PU
ST-B-HD 6	70500	8 mm	6 mm	16 mm	10
ST-B-HD 10	70501	12 mm	10 mm	16 mm	10
ST-B-HD 12	70502	15 mm	12 mm	16 mm	10
ST-B-HD 16	70503	19 mm	16 mm	16 mm	10
ST-B-HD 22	70504	25 mm	22 mm	21 mm	10
ST-B-HDD 6 detectable	70620	8 mm	6 mm	16 mm	10
ST-B-HDD 10 detectable	70621	12 mm	10 mm	16 mm	10
ST-B-HDD 12 detectable	70622	15 mm	12 mm	16 mm	10
ST-B-HDD 16 detectable	70623	19 mm	16 mm	16 mm	10
ST-B-HDD 22 detectable	70624	25 mm	22 mm	21 mm	10



KB-HDD | KBH-HDD

Detectable cable ties and holders for cable ties

Hygienic Design Line



Detectable cable ties KB-HDD

Type	Length	Width	Order No.	PU
Cable ties KB 2.5 x 100 HDD	100 mm	2.5 mm	70680	100
Cable ties KB 3.6 x 150 HDD	150 mm	3.6 mm	70681	100
Cable ties KB 4.8 x 200 HDD	200 mm	4.8 mm	70682	100
Cable ties KB 4.8 x 300 HDD	300 mm	4.8 mm	70683	100

Detectable holders for cable ties KBH-HDD

Type	Length	Width	Order No.	PU
Holder for cable ties KBH 27 x 27 HDD	27 mm	27 mm	70710	100



Product description

The detectable cables ties and holders for cable ties are particularly suitable for pharmaceutical applications and for the food industry. The cable ties can be used to close packagings and transport containers.

The detectable cable ties and holders are used to install cables in the production systems. Cable ties are proven aids for the economical bundling and fastening of cables, cable harnesses, pipes and hoses. At the same time, the cable ties achieve a very high strain relief.

The holder is mounted using a screw assembly or an adhesive surface.

Advantages

- Cable ties: High resistance to aromatic solvents, oils, greases, mineral products
- Blue colour for clear visual recognition
- Detectable using metal detectors X-ray devices
- Support in quality assurance within food production, for example within the framework of HACCP

Specifications KB-HDD

Material	Polyamide
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +85°C

Specifications KBH-HDD

Material	Polyamide
Dimensions	27 x 27 mm
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +60°C; recommended application temperature +15°C to +40°C
Properties	For cable ties up to 4.8 mm wide

2.3 Flexible cable entry grommets for cables without connectors



Fast and easy, partially tool-free assembly

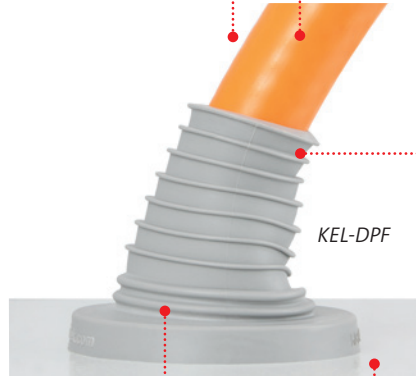


High flexibility when routing rigid cables

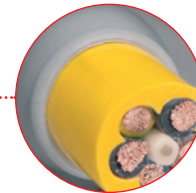
2.3



KEL-SCDP



KEL-DPF



Up to IP66/IP68 rated protection

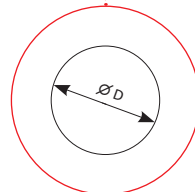


Easy peeling of the membrane rings. The peeled-off area is always round and thus seals the cable very well.



Due to high elasticity also suitable for routing preassembled cable lugs/terminals.

Compact, space-saving design



For metric cut-outs M25 – M85 (KEL-DPF)

Chapter content



Cable entry plates
pluggable, for cable diameters up to 36 mm

KEL-SCDP / KEL-SCDP-RW

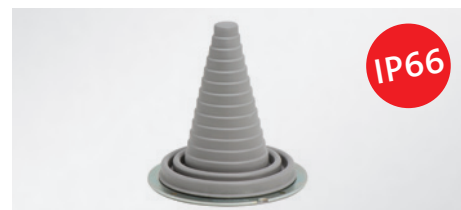
136 – 137



Cable entry grommets
M25 – M85, for cable diameters
up to 70 mm

KEL-DPF

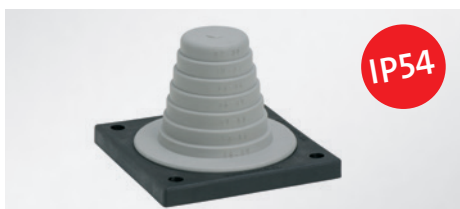
138 – 139



Cable entry grommets
screw mounting, for cable diameters
up to 115 mm

KEL-ULTRA flex

140



Cable entry grommets
screw mounting, for cable diameters
up to 68 mm

KEL-JUMBO flex

141

KEL-SCDP | KEL-SCDP-RW

Cable entry plate

Product description

With the KEL-SCDP cable entry grommet, single cables, hoses, and conduits can be routed and sealed at a rating of IP65. Its unique advantage is the large sealing range.

The single circular membrane can be peeled away to accommodate the specific diameter of the cable or hose. No tooling is required to peel off the membrane. The peeled-off area is always round, ensuring a secure seal around the cable or the hose.

2.3

Another advantage is the high mounting flexibility. The KEL-SCDP can simply be plugged into cut-outs with wall thicknesses from 1.5 to 4.0 mm.

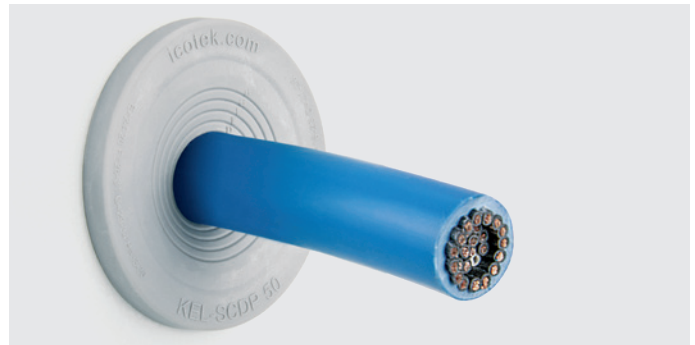
The version KEL-SCDP-RW is approved for the use in the railway technology in accordance with EN45545-2 HL3.

Advantages & benefits

- Approved for the use in the railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Perfect edge protection and sealing
- Circular membranes can be peeled off easily
- Easy, tool-free assembly
- Protection class up to IP65

Specifications

Material	Elastomer
Colour	■ grey (similar RAL 7035)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP65
Temperature	KEL-SCDP: -40°C to +80°C (static) KEL-SCDP-RW: -40°C to +90°C (static)
Properties	Halogen-free, silicone-free



Due to high elasticity also suitable for routing preassembled cable lugs or terminals.



KEL-SCDP | KEL-SCDP-RW

Cable entry plate



	Type	Order No.	Number of cables	Clamping range mm	PU
	KEL-SCDP 25	■ 43480	1 max.	5 – 16 mm	10
	KEL-SCDP 32	■ 43481	1 max.	5 – 22 mm	10
	KEL-SCDP 40	■ 43482	1 max.	8 – 28 mm	10
	KEL-SCDP 50	■ 43483	1 max.	8 – 36 mm	10
KEL-SCDP-RW for the use in the railway technology					
	KEL-SCDP-RW 25	■ 43490	1 max.	5 – 16 mm	10
	KEL-SCDP-RW 32	■ 43491	1 max.	5 – 22 mm	10
	KEL-SCDP-RW 40	■ 43492	1 max.	8 – 28 mm	10
	KEL-SCDP-RW 50	■ 43493	1 max.	8 – 36 mm	10

2.3



The single membrane rings are peeled off according to the diameter of the routed cable or hose. For this purpose, only a small hole between the rings needs to be pierced. Then the corresponding ring can be removed.

KEL-DPF

Cable entry grommets

Product description

The KEL-DPF was developed particularly for routing large or unknown sizes of cables into a switch cabinet or machine (max. cable diameter 70 mm). Due to the flexibility and unique pyramid shape, cable entry and flexible positioning is much easier compared to using conventional cable glands. Also perfect for bundling or restraining large cables.

2.3

Cutting of DPF grommets: Cable diameter less 20%. The corresponding diameters are marked on the grommet.

It is recommended that additional strain relief be provided for cables using cable ties.

For mounting the KEL-DPF sizes 75 and 85 we offer suitable wrenches with widths for M75 and M85 plastic locknuts.

Advantages & benefits

- Quick and tool-free assembly
- It is possible to install rigid cables at angles
- Suitable for metric cut-outs
- Polyamide locknuts are included in the shipment

Specifications

Material	Thread frame: Polyamide (PA) Pyramid: Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP66/ IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Thread length	11 mm; KEL-DPF 85 48-70: 14 mm
Cut-out dimensions	Metric sizes

Accessories

FP Flanged plates	236 - 245
MP Module plates	230 - 231



Wrenches

for M75/M85 plastic locknuts

Material: Aluminium

M75: Order No.61436 | M85: Order No. 61437 | PU: 1



Due to high elasticity also suitable for routing preassembled cable lugs or terminals.





IP66

IP68

UL TYPE 12

UL TYPE 4X



HL3 EN 45545-2



UV ISO 4892-2A

ECOLAB certified

RoHS compliant

Made in Germany



icotek®

KEL-DPF Cable entry grommets



IP66 IP68

	Type	Order No.	Thread metric	External diameter	Clamping range	PU
	KEL-DPF 25 3-12	<ul style="list-style-type: none"> ■ 42652 ■ 50652 	M25 × 1.5	39 mm	3 – 12 mm	5
	KEL-DPF 32 6-18	<ul style="list-style-type: none"> ■ 42653 ■ 50653 	M32 × 1.5	46 mm	6 – 18 mm	5
	KEL-DPF 40 12-27	<ul style="list-style-type: none"> ■ 42654 ■ 50654 	M40 × 1.5	54 mm	12 – 27 mm	5
	KEL-DPF 50 22-36	<ul style="list-style-type: none"> ■ 42655 ■ 50655 	M50 × 1.5	64 mm	22 – 36 mm	5
	KEL-DPF 63 27-50	<ul style="list-style-type: none"> ■ 42656 ■ 50656 	M63 × 1.5	77 mm	27 – 50 mm	5
	KEL-DPF 75 39-60	<ul style="list-style-type: none"> ■ 42657 ■ 50657 	M75 × 1.5	89 mm	39 – 60 mm	1
	KEL-DPF 85 48-70	<ul style="list-style-type: none"> ■ 42658 ■ 50658 	M85 × 2	99 mm	48 – 70 mm	1

2.3

* Only valid for grey product types

KEL-ULTRA flex

Cable entry grommets



Product description

The KEL-ULTRA flex is designed as a cable entry grommet for any large cable or conduit that is difficult to manage. The KEL-ULTRA flex comes in two sizes and is ideal for routing and sealing cables and conduits with a diameter from 25 to 115 mm. Due to the high flexibility of the elastomer pyramid, inserting large, thick cables with KEL-ULTRA flex is easier than using standard cable glands.

2.3

After inserting the cable or conduit, the KEL-ULTRA flex is quickly and easily mounted with the metal ring and screws. This ring enables a circular fixing and sealing of the grommet at the enclosure wall. The ring is supplied with each KEL-ULTRA flex. Cutting of grommets: Cable diameter less 25%. It is recommended that additional strain relief be provided for cables as part of the installation.

Advantages & benefits

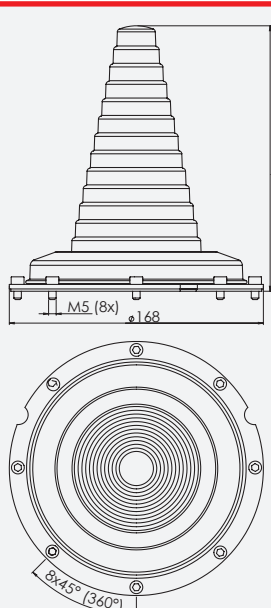
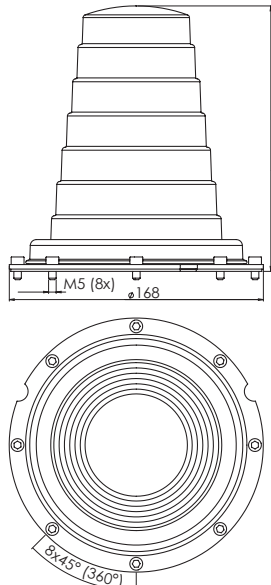
- Quick assembly
- Grommets allow easy orientation and seal of rigid cables
- IP66/up to UL type 12 rating

Specifications

Material	Pyramid: Elastomer Fixing metal ring: Steel, zinc-plated Blind plate: Steel, zinc-plated
Flame class	UL 94 V-o, self-extinguishing
IP rating	IP66, when fastened with 8 screws (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Round, ϕ -cable +30%, max. ϕ 140 mm

Accessories

MP Module plates	230 - 231
BPM Blank plates	247

Description	Type	Order No.	Sealing range	PU
	KEL-ULTRA flex 1 incl. fixing screws	42630	25 - max. 90 mm cable diameter	1
	KEL-ULTRA flex 2 incl. fixing screws	42631	75 - max. 115 mm cable diameter	1



KEL-JUMBO flex

Cable entry grommets



Product description

The KEL-JUMBO flex is a flexible cable entry grommet for cables without connectors with a diameter range from 27 – 68 mm.

They are ideal for the routing supply cables into the switch cabinets.

Cutting of KEL-JUMBO flex grommets: Cable diameter less 25%. The corresponding diameters are marked on the grommet.

It is recommended that additional strain relief be provided for cables as part of the installation.

Advantages & benefits

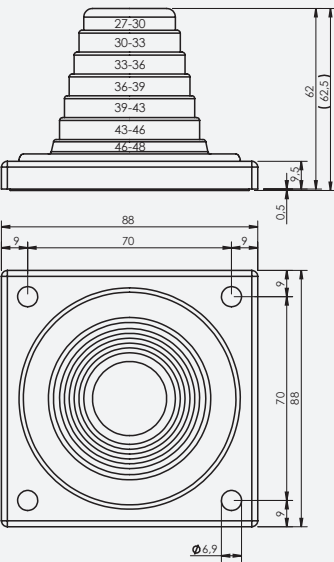
- Quick assembly
- Grommets allow dynamic and flexible movement of rigid cables
- Compact installation area (88 × 88 mm)

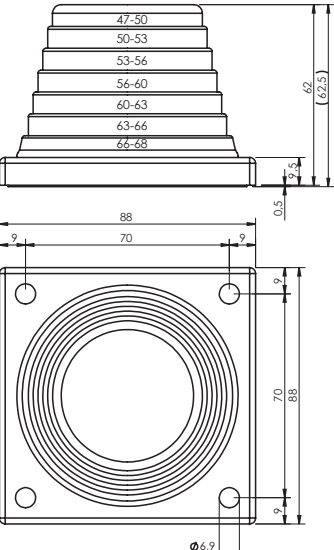
Specifications

Material	Frame: Polyamide (PA) Pyramid: Elastomer
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	-40°C to +100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimensions	Round, \varnothing -cable +20%

Accessories

MP Module plates	230 - 231
BP Blank plates	220 - 221

Description	Type	Order No.	Clamping range	PU
	KEL-JUMBO flex 27-48	42614	27 - 48 mm	1

	KEL-JUMBO flex 47-68	42616	47 - 68 mm	1
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3 Strain relief & cable management



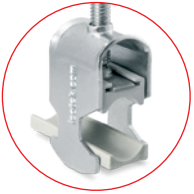
By using icotek strain relief systems the user can quickly assemble, organise and provide strain relief for cables according to EN 62444.

The systems can be used for organising and securing cables in machines, switch cabinets, enclosures and dynamic drag chains. Due to the wide variety of mounting requirements, options range from DIN rail snap-mount, C-rail to screw mount.

The strain relief plates are available in several sizes. The cable density can be greatly increased by using spacers for multilayer mounting.

Securing the cables is done quickly and inexpensively with standard cable ties. The shape of the strain relief securely holds cable tie and cable.

3



Space-saving solution for mounting on C-rails



High cable density, multilayer mounting possible



Fast and easy, partially tool-free mounting



Wide mounting type variety: DIN rail/C-rail snap mount, screw mount



Available in various sizes



Secure hold of the cable ties and cables, strain relief acc. to EN 62444



Chapter content



Cable clamp
for C-rail mount

CCL

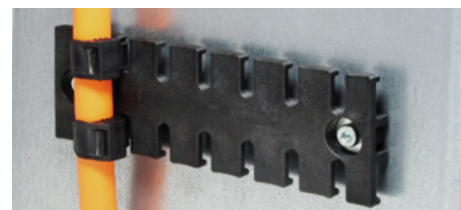
144



Strain relief plates
for screw mount

ZL

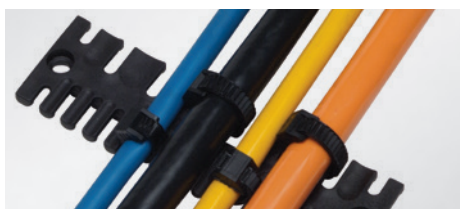
145



Strain relief plates
for screw mount, with bushings

ZL-AB / ZL-MS

146



Strain relief plates
for screw mount, for various cable diameters

ZL 03 | 04 | 05

147



Strain relief plates
for 35 mm DIN rail / C-rail snap mount

KZL

148



Strain relief plates
for 35 mm DIN rail snap mount

SF|ZL

149



Spacers
for multilayer mounting of strain relief plates

DH

147



EMC Strain relief plates

KAFM-EMC

186



Shield plate for ZL strain relief plates

ZL|SB-EMC

187



Hook-and-loop cable ties
re-usable

KLKB | KLB

150



Holder for hook-and-loop cable ties
various mounting types

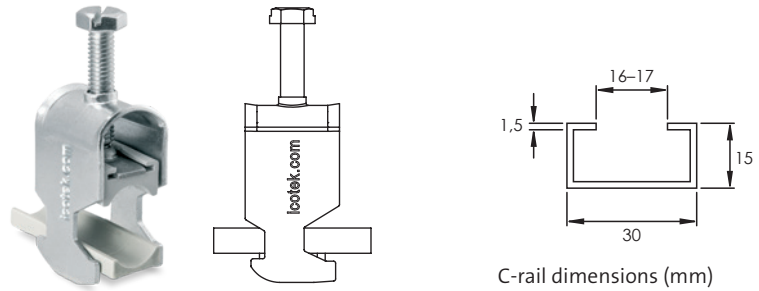
KBH

151

3

CCL

Cable clamp for C-rails



Product description

The cable clamps are characterized by a high clamping range and great flexibility. Ideally suited for strain relief on the C-rail for opening dimensions 16 – 17 mm. It offers flexible clamping ranges from 6 mm to 64 mm.

The counter trough integrated in the cable clamp is secured by a locking mechanism and cannot slip out of the cable clamp under tensile load.

3

Advantages & benefits

- Quick and easy assembly
- Tool-free and space-saving assembly
- Large variety of clamping areas from 6 to 64 mm
- High packing density
- For mounting on all common C-rails with 16 – 17 mm opening dimensions

Specifications

Material Galvanized steel

Type	Clamping range	Order No.	PU
CCL 6-13	6 – 13 mm	32000	25
CCL 12-19	12 – 19 mm	32001	25
CCL 18-23	18 – 23 mm	32002	25
CCL 22-32	22 – 32 mm	32003	25
CCL 30-38	30 – 38 mm	32004	25
CCL 38-42	38 – 42 mm	32005	25
CCL 42-50	42 – 50 mm	32006	25
CCL 50-64	50 – 64 mm	32007	25

Plastic counter trough (spare part)

Type	suitable for cable clamp	Order No.	PU
Counter trough Y 6/12	CCL 6-13	99215	50
Counter trough Y 12/18	CCL 12-19	99216	50
Counter trough Y 16/22	CCL 18-23	99217	50
Counter trough Y 22/38	CCL 22-32, CCL 30-38, CCL 38-42	99218	50
Counter trough Y 42/64	CCL 42-50, CCL 50-64	99219	50



Applications on the C-Rail with cable clamp CCL

ZL

Strain relief plates for screw assembly



Type	Order No.	Length L1	Length L2	No. of teeth	PU
ZL 39	32222	38.5 mm	19.5 mm	3	10
ZL 60	32224	59.5 mm	43.5 mm	4	10
ZL 70	32226	69.1 mm	43.5 mm	5	10
ZL 87	32228	86.5 mm	68 mm	6	10
ZL 103	32230	102.5 mm	84 mm	7	10
ZL 121	32232	121 mm	102.5 mm	8	10
ZL 140	32234	139.5 mm	121 mm	9	10
ZL 180	32236	180 mm	157 mm	12	10

Product description

The strain relief plate ZL is used for static or dynamic applications for organising and securing cables on machines, control panels or drag chains.

The design of the strain relief unit provides secure strain relief according to EN 62444. Mount of the cables or pneumatic tubing is easily done using cable ties.

For multilayer installation please use DH spacers.

Advantages & benefits

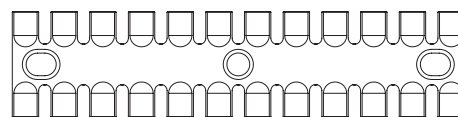
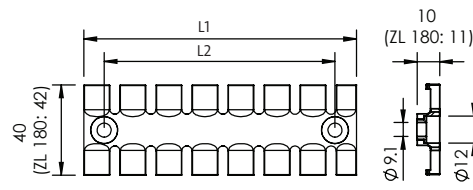
- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Specifications

Material Polyamide (PA)
 Flame class UL 94 V-0, self-extinguishing
 Temperature -40°C to +140°C (static)
 Properties Halogen-free, silicone-free

Accessories

DH Spacers 147
 ZL|SB-EMC Shield plates 191



ZL 180



3

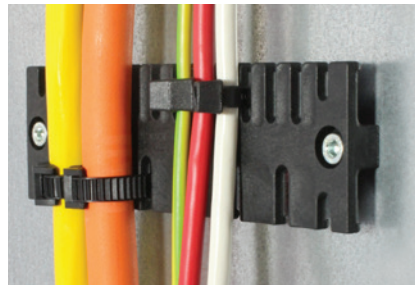
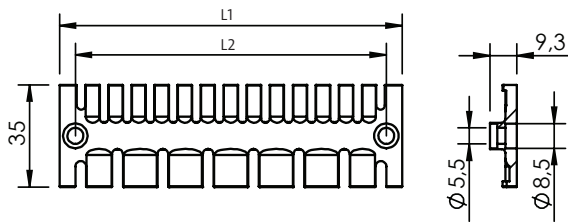


ZL 03 | 04 | 05

Strain relief plates for screw assembly for various cable diameters



Type	Order No.	Length L1	Length L2	No. of teeth	PU
ZL 03	32112	63.4 mm	42 mm	4 7	10
ZL 04	32114	95 mm	74.5 mm	6 11	10
ZL 05	32116	119 mm	108 mm	7 13	10



Product description

Strain relief plates ZL feature different comb widths. Thus providing a multi-purpose product for various cable sizes. The design of the strain relief unit provides secure strain relief according to EN 62444. Mounting of the cables or pneumatic tubing is easily done using cable ties.

Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free

3

Type	Order No.	Fits with	Length	Diameter		PU
				inner	outer	
DH 30	32251	ZL 03 04 05	30 mm	5.2 mm	8.5 mm	10
DH 32	32252	ZL	32 mm	6.2 mm	12 mm	10

DH Spacers

Due to DH spacers strain relief plates can be mounted in multi-layers to achieve an increase of the cable density.

Advantages & benefits

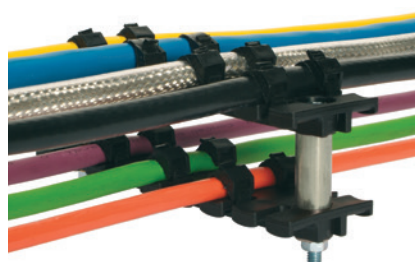
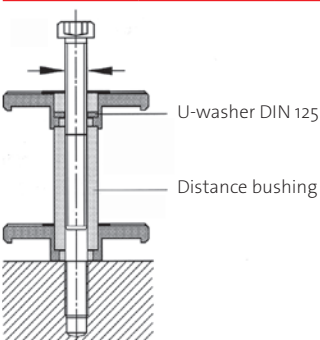
- Increase of cable density

Specifications

Material Aluminium

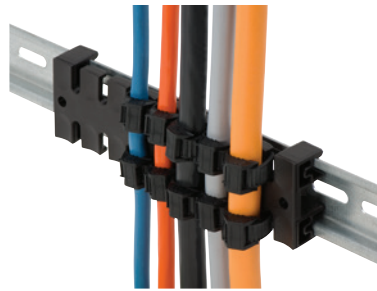
Compatible with

ZL Strain relief plates	145
ZL 03 04 05 Strain relief plates	147



KZL

Strain relief plates for mounting rails



Product description

The strain relief plate KZL is used for static or dynamic applications for organising and securing cables on machines, control panels or drag chains.

The design of the strain relief unit provides secure strain relief according to EN 62444. Mount of the cables or pneumatic tubing is easily done using cable ties.

3 KZL Strain relief plates can be mounted on 30 mm DIN rails (C-rails) and 35 mm DIN rails.

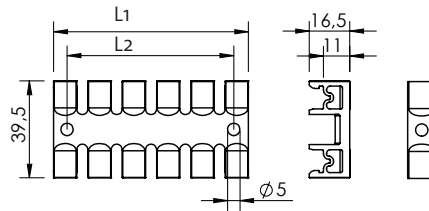
Typ	Best.Nr.	Length L1	Length L2	No. of teeth	VE
KZL 11	32250	11.5 mm	–	1	10
KZL 39	32260	38.5 mm	28.3 mm	3	10
KZL 80	32262	79.5 mm	68 mm	6	10
KZL 140	32264	139.5 mm	128.1 mm	9	10

Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Specifications

Material Polyamide (PA)
 Flame class UL 94 V-0, self-extinguishing
 Temperature -40°C to +140°C (static)
 Properties Halogen-free, silicone-free



SF|ZL

Strain relief plates for 35 mm DIN rail



Type	Order No.	Length L1	Length L2	No. of teeth	PU
SF ZL 39	32351	38.5 mm	19.5 mm	3	10
SF ZL 60	32352	59.5 mm	43.5 mm	4	10
SF ZL 70	32353	69.1 mm	43.5 mm	5	10
SF ZL 87	32354	86.5 mm	68 mm	6	10
SF ZL 103	32355	102.5 mm	84 mm	7	10
SF ZL 121	32356	121 mm	102.5 mm	8	10
SF ZL 140	32357	139.5 mm	121 mm	9	10
SF ZL 180	32358	180 mm	157 mm	12	10

Product description

The strain relief plate SF|ZL is used for assembly on 35 mm DIN rails. It can be used for strain relief of cables and conduits.

The SF|ZL range is based upon the strain relief plate ZL, which is mounted on snap feet for 35 mm DIN rails.

Advantages & benefits

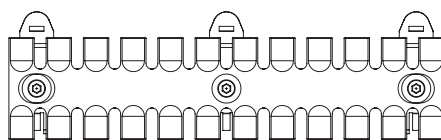
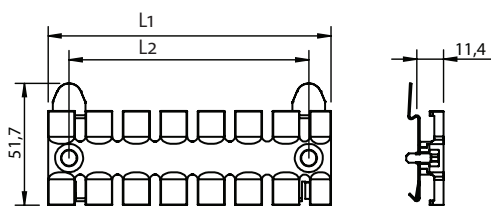
- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options

Specifications

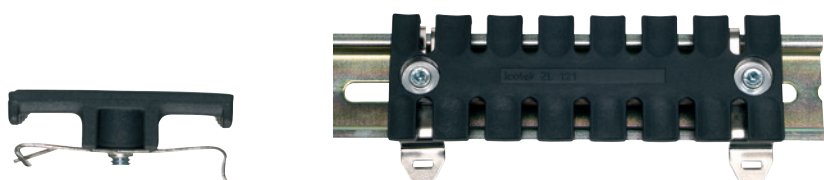
Material	ZL: Polyamide (PA) SF-foot: Spring steel
Flame class	UL 94 V-0, self-extinguishing
Temperature	-40°C to +140°C (static)
Properties	Halogen-free, silicone-free

Accessories

ZL|SB-EMC Shield plates 191



SF|ZL 180



KLKB | KLB

Hook-and-loop cable ties



Product description

Cable ties with hook-and-loop fasteners are a more and more common fixing mode for cables. They are used instead of standard cable ties, because they can be easily closed and opened several times. The soft material is gentle on cables, especially where vibrations are present.

Hook-and-loop cable ties are available individually (KLKB) in four different sizes or as a continuous roll (KLB) in four different sizes.

3

Advantages

- Reusable
- Adaptable
- The cable tie material is gentle on cables, especially if there are vibrations

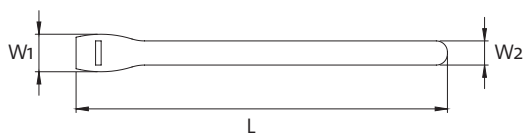
Specifications

Material	Polypropylene + Velours PA
Colour	black
Flame class	UL 94 V-2
Temperature	-30°C to +80°C

Accessories

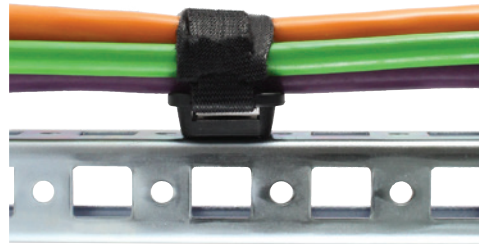
KBH Holder for hook-and-loop fastener 151

Type	Size [mm]			Order No.	PU
	L	W1	W2		
KLKB 200 × 7 bk (PU 100 = 1 reel)	200	13	7	61021	100
KLKB 200 × 7 bk on reel (750 pcs.)	200	13	7	61025	1
KLKB 200 × 13 bk (PU 100 = 1 reel)	200	20	13	61022	100
KLKB 200 × 13 bk on reel (750 pcs.)	200	20	13	61026	1
KLKB 230 × 13 bk (PU 100 = 1 reel)	230	20	13	61023	100
KLKB 230 × 13 bk on reel (650 pcs.)	230	20	13	61027	1
KLKB 300 × 17 bk (PU 100 = 1 reel)	300	25	17	61024	100
KLKB 300 × 17 bk on reel (500 pcs.)	300	25	17	61028	1
KLB 10 bk			10	61011	25 m
KLB 15 bk			15	61012	25 m
KLB 20 bk			20	61013	25 m
KLB 25 bk			25	61014	25 m



KBH

Holder for hook-and-loop fastener



Description	Type	Order No.	fits KLKB KLB	Compatible with	PU
Holder for hook-and-loop fastener, screwable					
	KBH-S	■ 61019	KLKB 200 × 7 KLKB 200 × 13 KLB 10	23 × 23 mm mounting rail	100
	KBH-SB	■ 61002	KLKB 200 × 7	universal	100
Holder for hook-and-loop fastener, pluggable					
	KBH-R	■ 61018	KLKB 200 × 7 KLKB 200 × 13 KLB 10	23 × 23 mm mounting rail systems for Rittal VX25	100
	KBH-RBA nc	□ 61003	KLKB 200 × 7	drill-hole Ø 6 mm	100
	KBH-RBB	■ 61004	KLKB 200 × 7	drill-hole Ø 6.5 mm	100

Product description

These holders can be used in combination with cable ties with hook-and-loop fastener KLKB and hook-and-loop tape KLB.

Large variety of holders provides unique and numerous mounting possibilities.

The KBH-R hook-and-loop tape holder is particularly suitable for tool-free mounting in the VX25 enclosure from Rittal.

Advantages

- Assembly within seconds
- Secure hold
- Flexible usage

Specifications KBH-S / KBH-R

Material Polyamide (PA)
 Colour ■ black
 Flame class UL 94 V-0, self-extinguishing
 Temperature -40°C to +110°C
 Properties Halogen-free, silicone-free

Specifications KBH-SB / KBH-RBA

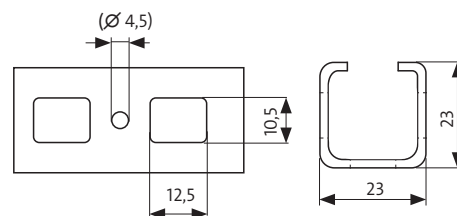
Material Polyamide (PA)
 Colour ■ black (KBH-SB)
 □ nc (KBH-RBA)
 Flame class UL 94 V-2
 Temperature -40°C to +85°C (short-term to 110°C)

Specifications KBH-RBB

Material Polyamide (PA)
 Colour ■ black
 Temperature -40°C to +120°C

Compatible with

KLKB/KLB Cable ties with
 hook-and-loop fastener 150



23 × 23 mm mounting rail

* Only KBH-S / KBH-R

4.1 EMC cable shield earthing

Shield clamps and earthing components



For process measurement and control equipment, an increasingly higher level of protection against failure is required. Earthing of the cable shields is very important. The area where the cable shield is connected to the enclosure earth is a critical point. It is very important that the connection has a low resistance.

icotek EMC products therefore provide a good solution. The SKL shield clamps offer a large contact area to the cable shield (see figure A). In comparison to conventional shield brackets (see figure B) an up to 50% higher

contact area can be achieved when using the SKL line. The specified clamping range can be exceeded up to 10%.

In high frequency fields, the SKL shield clamps provide a low resistance. The effective range is up to 1,000 MHz below 120 Ohms and 10 kHz to 100 MHz significant below 20 Ohms.

Assembly possibilities



Assembly with rivets



Assembly with screws



Assembly on 35 mm DIN rails



Assembly on 10 x 3 mm bus bars



Assembly on 30 mm C-rails



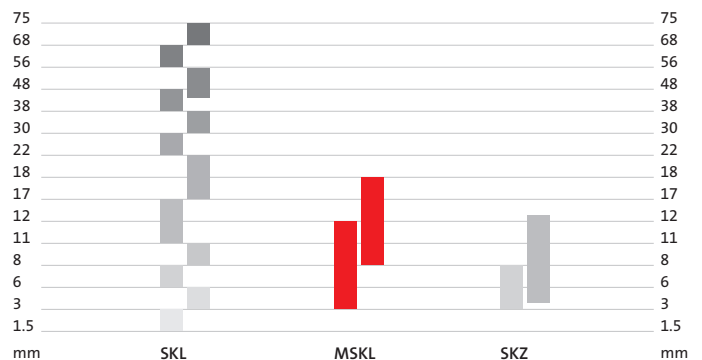
Assembly by clamping onto sheet edges

Advantages of solid rivets



- Vibration resistance according to EN 61373
- Twist protection due to solid rivets
- Stronger contact pressure of the riveted parts

Difference between SKL | MSKL | SKZ clamping ranges



* Shield connections are not certifiable as components according to the requirements of the directive and the standards for electrical equipment in potentially explosive atmospheres. Thus, the use of the shield connections in hazardous areas is possible even without a corresponding approval and marking.

MSKL type with large clamping range

Large contact area to the cable shield. Shield and cable strands will not be squeezed

Available in various sizes

High cable density possible

Vibration resistance and twist protection due to solid rivets

Wide variety in mounting types: DIN rail/C-rail snap mount, screw mount

Do not use the shield connection as a strain relief location!

Secure hold for cable ties and cables, strain relief acc. to EN 62444

Figure A: SKL-line

Figure B: Conventional systems

4.1



EMC shield clamps MSKL

Due to its special design, the clamping ranges of the MSKL are very large while the dimensions are comparatively small. (Example: MSKL 3-12, assembled with a 12 mm cable shield: width 26.25 mm).

Advantages & benefits

- Large clamping areas, therefore less product sizes needed to cover a large cable diameter range
- Space-saving design, even when fully assembled
- Partially with integrated strain relief
- Large cable shield contact area
- Easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free



More information about the connection between the cable shield and the equipotential bonding bar in PROFINET applications:
www.icotek.com/en/profinet

Chapter content



**EMC shield clamps
for assembly with rivets**

MSKL, SKL, RCL|MSKL, RCL|SKL, RCLZ|MSKL,
MB+MSKL/SKL

157 – 159



**EMC shield clamps
for assembly with screws
with/without strain relief function**

LFZ-M|MSKL, LFZ|SKL, LFZ-U|SKL, LFZ-U-AB,
LFZ-M(45°)|MSKL, LFZ-M(90°)|MSKL, LF2Z-M|SKL,
SKZ, LF|MSKL, LF|SKL, SK

160 – 161



**EMC shield clamps
for 35 mm DIN rails
with/without strain relief function**

SFZ-M|MSKL, SFZ|SKL, SF2Z-M|MSKL,
SF2Z|SKL, SF|SKZ, SF-M|MSKL, SF|SKL,
SFS|SKL, SF|SK

162 – 163



**EMC shield clamps
for 10 x 3 mm bus bars
with/without strain relief function**

PFSZ-M|MSKL, PFSZ|SKL, PFS2Z-M|MSKL,
PFS2Z|SKL, SS|SKZ, PFS|SKL, PFS|SCL, SS|SK,
SKS, PFS2Z|SKL, PFS2|SKL

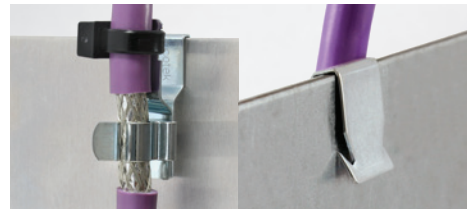
164 – 167



**EMC shield clamps
for 30 mm C-rails
with/without strain relief function**

SC|LFZ-M|MSKL, SC|LFZ|SKL, SC|LF2Z-M|MSKL,
SC|SKZ, SC|LF|MSKL, SC|LF|SKL, SC|SK,
LFC, CC-LFC

168 – 171



**EMC shield clamps
for assembly on sheet edges
with/without strain relief function**

PFKZ-M|MSKL, PFKZ|SKL, PFK|SKL,
PFK2Z|SKL, PFK2|SKL

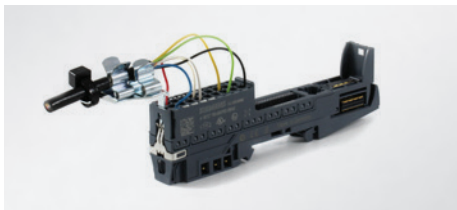
172 – 175



**Shield clamps
for printed circuit boards**

PCB|SKL

176



**Shield clamps
for decentralised bus modules**

STFZ|SKL / STFZ2|SKL / STFZ-U|SKL /
STFZ-SP|SKL / STFZ2-SP|SKL

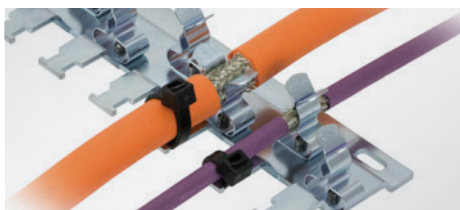
177 – 179



Assortment of SKL shield clamps

EMC ServiceBox multi
EMC ServiceBox

180 – 181



EMC Shield clamp assemblies

RLFZ(-M) - clamp assembly for screw mount
 SC|RLFZ(-M) - clamp assembly for C-rails
 SF|RLFZ - clamp assembly for DIN-rails
 RLF - clamp assembly without strain relief

182 – 185



EMC cable assemblies
 as accessories for cable entry components

KEL-EMC-Z / KEL-EMC-PF / KEL-EMC /
 KVT-EMC

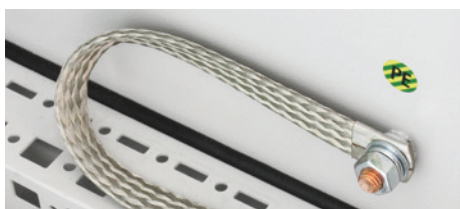
186 – 189



EMC strain relief plates
 various mounting types

KAFM

190 – 191



Earthing tapes

MB

192 – 194



EMC Cable entry frames

EMC-KEL-DS

198 – 199



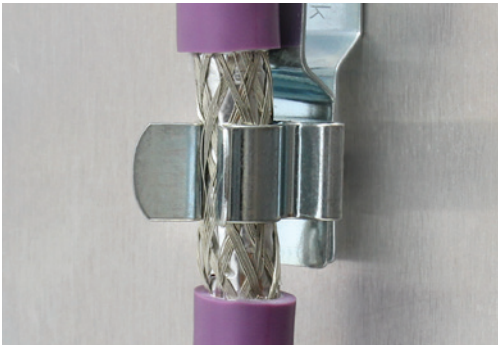
EMC Split cable gland

EMC-KVT-DS

200 – 201

EMC

Test results



Leakage and Impedance

All icotek shield clamps have been tested utilising various frequency ranges and in all tests there was minimal leakage resistance.

4.1 icotek EMC shield clamps are proven to absorb electromagnetic interferences.

Electrical impedance values:
 - from 10 kHz to 100 MHz under 20 Ohm
 - up to 1.000 MHz under 120 Ohm

The unique design of icotek shield clamps effectively reduce high frequency interferences.

Contact area

The SKL shield clamps offer a large contact area to the cable shield (see figure A).

In comparison to conventional shield clamps, an up to 50% higher contact area is achieved when using the SKL product line.

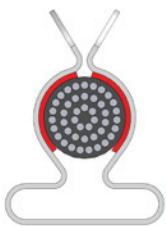


Figure A: SKL-line

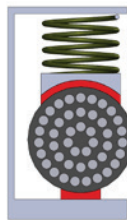
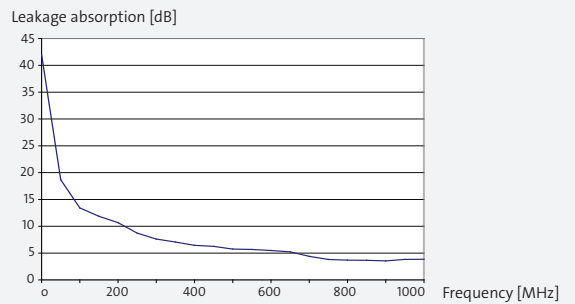
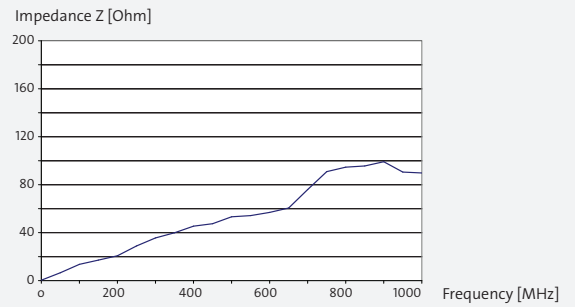
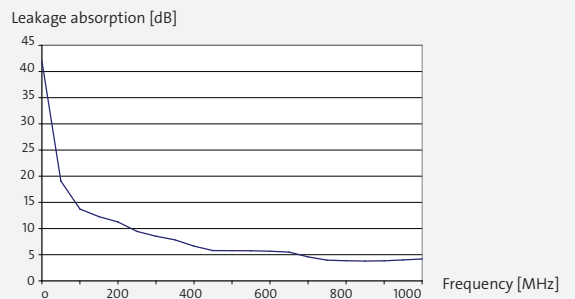
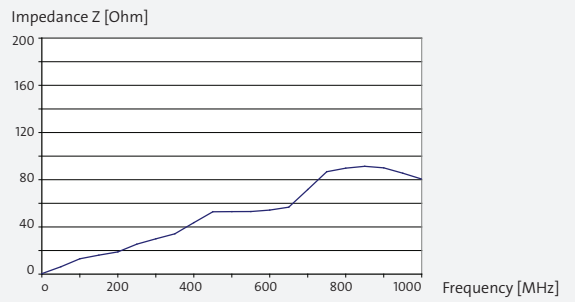


Figure B: Conventional systems

LF|SKL 8-11



SF|SKL 6-8



EMC shield clamps for assembly with rivets

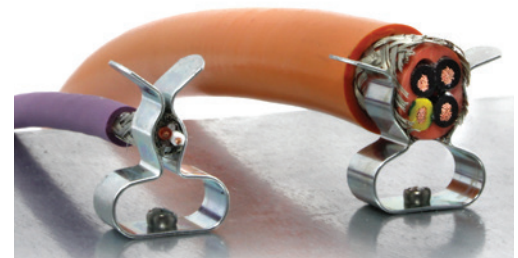


	MSKL single	SKL single	
Clamping range	Order No.	Order No.	
MSKL	3 – 12 mm	37600	–
	8 – 18 mm	37602	–
SKL	1.5 – 3 mm	–	36200
	3 – 6 mm	–	36202
	6 – 8 mm	–	36204
	8 – 11 mm	–	36205
	11 – 17 mm	–	36206
	17 – 22 mm	–	36207
	22 – 30 mm	–	36208
	30 – 38 mm **	–	36209 *
	38 – 48 mm **	–	36213 *
	44 – 56 mm	–	36216 *
56 – 68 mm	–	36217 *	
68 – 75 mm	–	36218 *	
PU	50	50 * 5	

SF single | SFS single | SC single

Type	Order No.	PU
SF single M4	36230	10
SF single M5	36221	10
SFS single	36229	10
SC single	36231	10

Screw-foot single, for 30 mm DIN-rail shape C (width of mouth: 16 mm) with twist protection notch



MSKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Due to its special design, the clamping ranges of the MSKL are very large while the dimensions are comparatively small. (Example: MSKL 3-12, assembled with a 12 mm cable shield: width 26.25 mm).

Assembly

The shield clamps can be mounted using rivets.

Advantages & benefits

- Large clamping areas, therefore less product sizes needed to cover a large cable diameter range
- Space-saving design, even when fully assembled
- Partially with integrated strain relief
- Large cable shield contact area
- Easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL clamp, SK clamp Spring steel, galvanised

** SKL 30–38 mm,

SKL 38–48 mm

Stainless steel

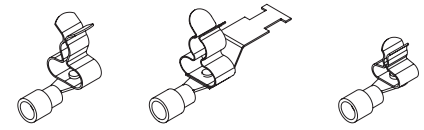
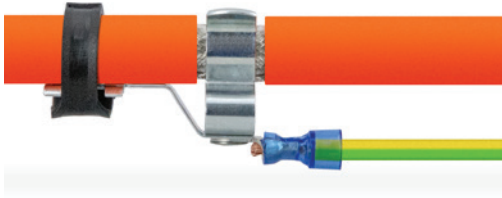


SF single



SFS single

EMC shield clamps on cable lugs for assembly with rivets



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Assembly

The shield clamps can be mounted using rivets.

Advantages & benefits

- Large contact area
- Simple and tool-free mounting, easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free
- Designed for high density applications

Specifications

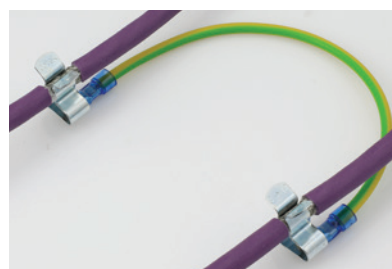
Material

MSKL clamp, SK clamp Spring steel, galvanised
Cable lug UL listed

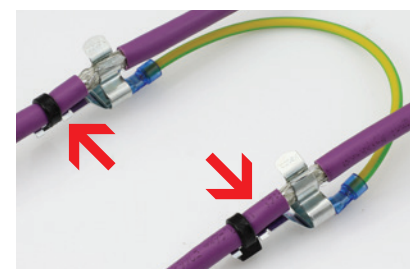


		RCL MSKL	RCLZ MSKL with cable fixation	RCL SKL	
Clamping range	RCL	Order No.	Order No.	Order No.	
MSKL	3 – 12 mm	0.5 – 1.5 mm	36296.2	36301.2	–
	3 – 12 mm	1.0 – 2.5 mm	36297.2	36302.2	–
	3 – 12 mm	4 – 6 mm	36298.2	36303.2	–
SKL	1.5 – 3 mm	0.5 – 1.5 mm	–	–	36296.1
	1.5 – 3 mm	1.0 – 2.5 mm	–	–	36297.1
	1.5 – 3 mm	4 – 6 mm	–	–	36298.1
	3 – 6 mm	1.0 – 2.5 mm	–	–	NEW 36297.3
	6 – 8 mm	1.0 – 2.5 mm	–	–	NEW 36297.4
	8 – 11 mm	1.0 – 2.5 mm	–	–	NEW 36297.5
PU		25	25	25	

Applications in which both cable shields must be brought to the same potential.



Example for an application with RCL|MSKL 3-12.



Example for an application with RCLZ|MSKL 3-12. The contacted electrical cables are also fixed.

RoHS
compliant

NEW

icotek®

MB|MSKL

Earthing tapes with fitted shield clamps with/without cable fixation

Type	Order No.	Length L [mm]	Cross-section mm ²	Hole size	Clamping range [mm]	PU
Cross-section 6 mm²						
MB 100 6 M4+M4 MSKL 3-12	32695.01	100	6	M4	3 – 12	10
MB 100 6 M4+M4 MSKL 8-18	32695.02	100	6	M4	8 – 18	10
MB 100 6 M4+M4 Z-MSKL 3-12*	32695.011	100	6	M4	3 – 12	10
MB 100 6 M4+M4 Z-MSKL 8-18*	32695.021	100	6	M4	8 – 18	10
MB 150 6 M4+M4 MSKL 3-12	39710.01	150	6	M4	3 – 12	10
MB 150 6 M4+M4 MSKL 8-18	39710.02	150	6	M4	8 – 18	10
MB 150 6 M4+M4 Z-MSKL 3-12*	39710.011	150	6	M4	3 – 12	10
MB 150 6 M4+M4 Z-MSKL 8-18*	39710.021	150	6	M4	8 – 18	10
MB 200 6 M4+M4 MSKL 3-12	32707.01	200	6	M4	3 – 12	10
MB 200 6 M4+M4 MSKL 8-18	32707.02	200	6	M4	8 – 18	10
MB 200 6 M4+M4 Z-MSKL 3-12*	32707.011	200	6	M4	3 – 12	10
MB 200 6 M4+M4 Z-MSKL 8-18*	32707.021	200	6	M4	8 – 18	10
Cross-section 10 mm²						
MB 100 10 M6+M4 MSKL 3-12	39711.01	100	10	M4	3 – 12	10
MB 100 10 M6+M4 MSKL 8-18	39711.02	100	10	M4	8 – 18	10
MB 100 10 M6+M4 Z-MSKL 3-12*	39711.011	100	10	M4	3 – 12	10
MB 100 10 M6+M4 Z-MSKL 8-18*	39711.021	100	10	M4	8 – 18	10



Product description

The earthing tapes are fitted with a shield clamp at one end. This solution is used where space is limited.

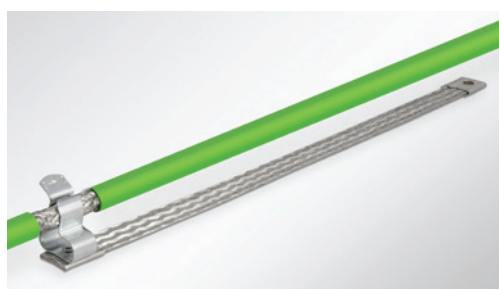
The earthing tapes are available with M4 or M6 holes.

Advantages

- Very flexible assembly
- Installation even in places that are difficult to access
- Earthing tapes with pressed-on connecting end pads
- Standard products, short delivery times
- UL listed earthing tapes

Specifications

Material Earthing tape:
Copper tin-plated
with pressed-on connecting end pads
Shield clamp MSKL:
Spring steel galvanised



Earthing tape with shield clamp MSKL



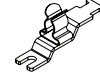
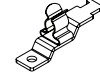
Earthing tape with shield clamp MSKL and cable fixation

* with cable fixation

EMC shield clamps for assembly with screws with strain relief function



LFZ-M|MSKL



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Shield clamps are easily attached to mounting plates via screw. The shield clamp LFZ-U|SKL is available for M4 or M5 screws. During assembly it is sufficient to loosen the existing screw slightly to be able to slide the clamp underneath before re-tightening the screw.

Assembly

The shield clamps can be mounted using screws, e.g. on a mounting plate.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

Specifications

Material

MSKL clamp, SKL clamp	Spring steel, zinc plated
LF/LFZ foot	Steel, galvanically zinc plated fixing hole 4.2 mm/5.2 mm
SK bracket	Steel, galvanically zinc plated

		LFZ-M MSKL Fixing hole M4	LFZ SKL Fixing hole M4	LFZ-U SKL Fixing hole M4	LFZ-U SKL Fixing hole M5
	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37612	–	–	–
	8 – 18 mm	37614	–	–	–
SKL	1.5 – 3 mm	–	36910	36886.1	36887.1
	3 – 6 mm	–	36915	36886.2	36887.2
	6 – 8 mm	–	36920	36886.3	36887.3
	8 – 11 mm	–	36925	36886.4	36887.4
	11 – 17 mm	–	36930	36886.5	36887.5
	17 – 22 mm	–	36935	–	–
	22 – 30 mm	–	36940	–	–
	30 – 38 mm	–	36941	–	–
	PU	10	10	10	10

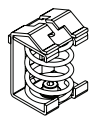
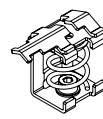
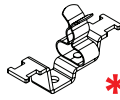
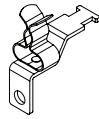
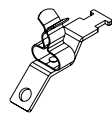
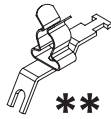


Made in Germany

RoHS compliant



EMC shield clamps for assembly with screws with/without strain relief function



	LFZ-U-AB Fixing hole M4	LFZ-M(45°) MSKL Fixing hole M5	LFZ-M(90°) MSKL Fixing hole M5	LF2Z-M MSKL* Fixing hole M4	SKZ Fixing hole M4	LF MSKL Fixing hole M4	LF SKL Fixing hole M4	SK Fixing hole M4	
	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.	
MSKL	3 – 12 mm	–	37660.1	37661.1	37665.150	–	37608	–	–
	8 – 18 mm	–	37660.2	37661.2	37666.150	–	37610	–	–
SKL	1.5 – 3 mm	–	–	–	–	–	–	36251	–
	3 – 6 mm	–	–	–	–	–	–	36253	–
	6 – 8 mm	36948.3	–	–	–	–	–	36255	–
	8 – 11 mm	36948.4	–	–	–	–	–	36256	–
	11 – 17 mm	–	–	–	–	–	–	36257	–
	17 – 22 mm	–	–	–	NEW 37590.150	–	–	36258	–
	22 – 30 mm	–	–	–	NEW 37591.150	–	–	36259	–
SK/SKZ	3 – 8 mm	–	–	–	–	36222	–	–	36222.002
	4 – 13.5 mm	–	–	–	–	36224	–	–	36224.002
	10 – 20 mm	–	–	–	–	–	–	–	36226
	15 – 32 mm	–	–	–	–	–	–	–	36228
PU	10	10	10	10	10	10	10	10	

* with double strain relief function

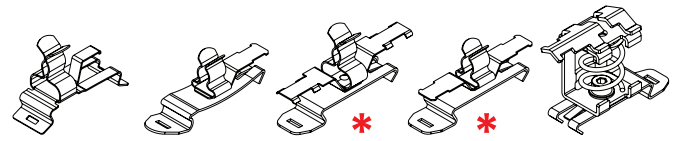
** LFZ-U-AB are especially suitable for mounting on Allen Bradley Powerflex 525/527 frequency inverters. Direct contacting on the converter saves space and interference signals are picked up directly at the interference source.



EMC shield clamps for 35 mm DIN rails with strain relief function



SFZ-M|MSKL



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 35 mm DIN rails.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

Specifications

Material

MSKL clamp, SKL clamp	Spring steel, zinc plated
SF/SFZ foot	Spring steel
SK bracket	Steel, galvanically zinc plated

		SFZ-M MSKL	SFZ SKL	SF2Z-M MSKL	SF2Z SKL	SF SKZ
	Clamping range	Order No.	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37620	–	37620.150	–	–
	8 – 18 mm	37622	–	37622.150	–	–
SKL	1.5 – 3 mm	–	36850	–	36850.150	–
	3 – 6 mm	–	36855	–	36855.150	–
	6 – 8 mm	–	36860	–	36860.150	–
	8 – 11 mm	–	36865	–	36865.150	–
	11 – 17 mm	–	36870	–	36870.150	–
	17 – 22 mm	–	36875	–	36875.150	–
	22 – 30 mm	–	36880	–	36880.150	–
SKZ	3 – 8 mm	–	–	–	–	36500
	4 – 13.5 mm	–	–	–	–	36502
PU		10	10	10	10	10

* with double strain relief function

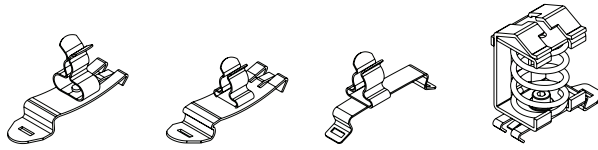


Made in Germany

RoHS compliant



EMC shield clamps for 35 mm DIN rails without strain relief



SFS|SKL

	SF-M MSKL	SF SKL	SFS SKL	SF SK
Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37616	–	–
	8 – 18 mm	37618	–	–
SKL	1.5 – 3 mm	–	36243	36810
	3 – 6 mm	–	36244	36815
	6 – 8 mm	–	36245	36820
	8 – 11 mm	–	36246	–
	11 – 17 mm	–	36247	–
	17 – 22 mm	–	36248	–
	22 – 30 mm	–	36249	–
	30 – 38 mm	–	36250	–
SK	38 – 48 mm	–	36252	–
	3 – 8 mm	–	–	36500.002
	4 – 13.5 mm	–	–	36502.002
	10 – 20 mm	–	–	36504
	15 – 32 mm	–	–	36506
PU	10	10	10	10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 35 mm DIN rails.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

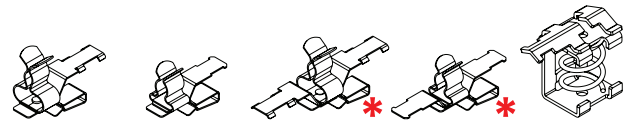
Material

MSKL clamp, SKL clamp Spring steel, zinc plated
 SF/SFZ foot Spring steel
 SK bracket Steel, galvanically zinc plated

EMC shield clamps for 10 × 3 mm bus bars with strain relief function



PFSZ-M|MSKL



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1 Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

Specifications

Material

- MSKL-clamp, SKL-clamp Spring steel, zinc plated
- PFS-foot Spring steel
- SK-bracket Sheet steel, galvanically zinc plated
- Bus bar Cu, tin plated, current load 140 A

Accessories

- KEL-EMV-PF cable assembly bracket 187
- MF Supports for bus bars 249

		PFSZ-M MSKL	PFSZ SKL	PFSZ2-M MSKL	PFSZ2 SKL	SS SKZ
	Clamping range	Order No.	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37630	–	37630.150	–	–
	8 – 18 mm	37632	–	37632.150	–	–
SKL	1.5 – 3 mm	–	36787.1	–	36787.151	–
	3 – 6 mm	–	36787.2	–	36787.152	–
	6 – 8 mm	–	36787.3	–	36787.153	–
	8 – 11 mm	–	36787.4	–	36787.154	–
	11 – 17 mm	–	36787.5	–	36787.155	–
	17 – 22 mm	–	36787.6	–	36787.156	–
SKZ	3 – 8 mm	–	–	–	–	36235
	4 – 13.5 mm	–	–	–	–	36236
	PU	10	10	10	10	10

* with double strain relief function

Bus bar 10 × 3 mm

Type	Order No.	PU	
Bus bar 10 × 3 mm	10 × 3 × 1000 mm*	36100	1

* Other lengths available on request

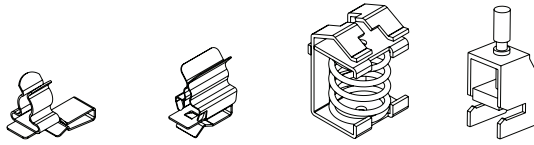


Made in Germany

RoHS compliant



EMC shield clamps for 10 × 3 mm bus bars without strain relief function



PFS|SKL

	PFS SKL	PFS SCL	SS SK	SKS	
Clamping range	Order No.	Order No.	Order No.	Order No.	
SKL	1.5 – 3 mm	36786.1	36611	–	
	3 – 6 mm	36786.2	36612	–	
	6 – 8 mm	36786.3	–	–	
	8 – 11 mm	36786.4	–	–	
	11 – 17 mm	36786.5	–	–	
	17 – 22 mm	36786.6	–	–	
SK	3 – 8 mm	–	–	36235.002	
	4 – 13.5 mm	–	–	36236.002	
	10 – 20 mm	–	–	36237	
	15 – 32 mm	–	–	36238	
SKS	2 – 5 mm	–	–	–	36282
	3 – 8 mm	–	–	–	36283
	3 – 14 mm	–	–	–	36284
	3 – 20 mm	–	–	–	36285
	5 – 28 mm	–	–	–	36286
	20 – 35 mm	–	–	–	36287
PU	10	10	10	10	

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

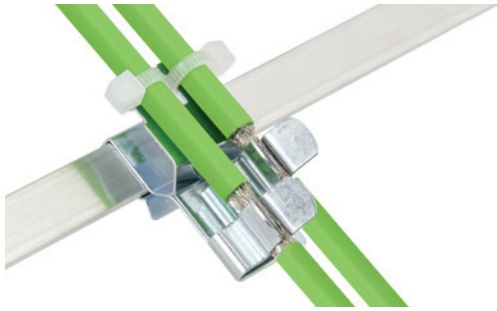
Material

MSKL-clamp,	Spring steel, zinc plated
SKL-clamp	Spring steel, zinc plated
PFS-foot	Spring steel
SK-bracket	Sheet steel, galvanically zinc plated
Bus bar	Cu, tin plated, current load 140 A

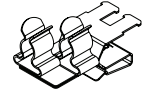
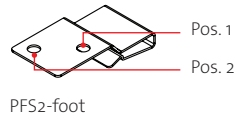
Accessories

KEL-EMV-PF cable assembly bracket	187
MF Supports for bus bars	249

EMC double shield clamps for 10 × 3 mm bus bars with strain relief function



PFS2z|SKL



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1 Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL-clamp	Spring steel, zinc plated
SKL-clamp	Spring steel
PFS-foot	Cu, tin plated, current load 140 A

Accessories

Bus bar	164/249
MF Supports for bus bars	249

PFS2z SKL		
Clamping range Pos. 1	Clamping range Pos. 2	Order No.
blank	1.5 – 3 mm	36789.01
blank	3 – 6 mm	36789.02
blank	6 – 8 mm	36789.03
blank	8 – 11 mm	36789.04
1.5 – 3 mm	blank	36789.10
1.5 – 3 mm	1.5 – 3 mm	36789.11
1.5 – 3 mm	3 – 6 mm	36789.12
1.5 – 3 mm	6 – 8 mm	36789.13
1.5 – 3 mm	8 – 11 mm	36789.14
3 – 6 mm	blank	36789.20
3 – 6 mm	1.5 – 3 mm	36789.21
3 – 6 mm	3 – 6 mm	36789.22
3 – 6 mm	6 – 8 mm	36789.23
3 – 6 mm	8 – 11 mm	36789.24
6 – 8 mm	blank	36789.30
6 – 8 mm	1.5 – 3 mm	36789.31
6 – 8 mm	3 – 6 mm	36789.32
6 – 8 mm	6 – 8 mm	36789.33
6 – 8 mm	8 – 11 mm	36789.34
8 – 11 mm	blank	36789.40
8 – 11 mm	1.5 – 3 mm	36789.41
8 – 11 mm	3 – 6 mm	36789.42
8 – 11 mm	6 – 8 mm	36789.43
PU		10

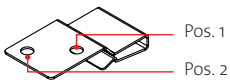


Made in Germany

RoHS compliant



EMC double shield clamps for 10 × 3 mm bus bars without strain relief function



PFS2-foot



PFS2|SKL



PFS2|SKL

	Clamping range Pos. 1	Clamping range Pos. 2	Order No.
SKL	blank	1.5 – 3 mm	36788.01
	blank	3 – 6 mm	36788.02
	blank	6 – 8 mm	36788.03
	blank	8 – 11 mm	36788.04
	1.5 – 3 mm	blank	36788.10
	1.5 – 3 mm	1.5 – 3 mm	36788.11
	1.5 – 3 mm	3 – 6 mm	36788.12
	1.5 – 3 mm	6 – 8 mm	36788.13
	1.5 – 3 mm	8 – 11 mm	36788.14
	3 – 6 mm	blank	36788.20
	3 – 6 mm	1.5 – 3 mm	36788.21
	3 – 6 mm	3 – 6 mm	36788.22
	3 – 6 mm	6 – 8 mm	36788.23
	3 – 6 mm	8 – 11 mm	36788.24
PU	6 – 8 mm	blank	36788.30
	6 – 8 mm	1.5 – 3 mm	36788.31
	6 – 8 mm	3 – 6 mm	36788.32
	6 – 8 mm	6 – 8 mm	36788.33
	6 – 8 mm	8 – 11 mm	36788.34
	8 – 11 mm	blank	36788.40
	8 – 11 mm	1.5 – 3 mm	36788.41
	8 – 11 mm	3 – 6 mm	36788.42
	8 – 11 mm	6 – 8 mm	36788.43
PU			10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

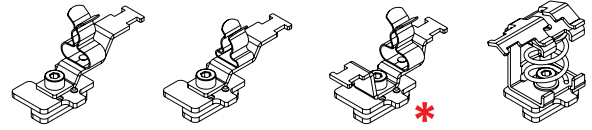
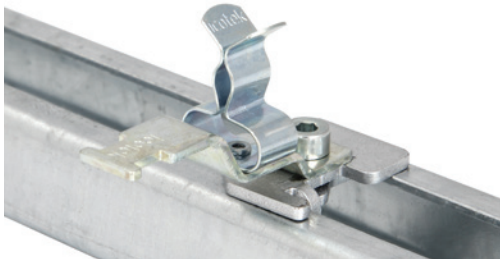
Material

MSKL-clamp	Spring steel, zinc plated
SKL-clamp	Spring steel
PFS-foot	Spring steel
Bus bar	Cu, tin plated, current load 140 A

Accessories

Bus bar	164/249
MF Supports for bus bars	249

EMC shield clamps for 30 mm C-rails with strain relief function



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 30 mm C-rails using the SC mounting foot (included in the shipment).

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines
- For mounting on all common C-rails with an opening dimension of 16–17 mm

Specifications

Material

MSKL-clamp,	Spring steel, zinc plated
SKL-clamp	Sheet steel, galvanically zinc plated
LFZ foot	Sheet steel, galvanically zinc plated Fixing hole M4
SC foot	Sheet steel, galvanically zinc plated
SK-bracket	Sheet steel, galvanically zinc plated

	SC LFZ-M MSKL Fixing hole M4	SC LFZ SKL Fixing hole M4	SC LF2Z-M MSKL Fixing hole M4	SC SKZ
	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37612.100	–	37612.150
	8 – 18 mm	37614.100	–	37614.150
SKL	1.5 – 3 mm	–	36910.100	–
	3 – 6 mm	–	36915.100	–
	6 – 8 mm	–	36920.100	–
	8 – 11 mm	–	36925.100	–
	11 – 17 mm	–	36930.100	–
	17 – 22 mm	–	36935.100	NEW 37594.150
	22 – 30 mm	–	36940.100	NEW 37595.150
SKZ	3 – 8 mm	–	–	36696
	4 – 13.5 mm	–	–	36700
PU	10	10	10	10

* with double strain relief function



SC foot single for C-rail
PU: 10, Order No. 36220

Screw-foot loose, for 30 mm DIN-rail shape C (width of mouth: 16 – 17 mm) with twist protection notch
PU: 10, Order No. 36231

SC-foot: space-saving design enables high cable density. Mounting foot adjusts itself when tightening the screw.

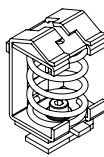
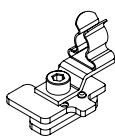
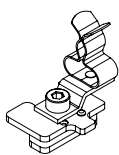


Made in Germany

RoHS compliant



EMC shield clamps for 30 mm C-rails without strain relief function



	SC LF MSKL Fixing hole M4	SC LF SKL Fixing hole M4	SC SK
Clamping range	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37608.100	–
	8 – 18 mm	37610.100	–
SKL	1.5 – 3 mm	–	36251.100
	3 – 6 mm	–	36253.100
	6 – 8 mm	–	36255.100
	8 – 11 mm	–	36256.100
	11 – 17 mm	–	36257.100
	17 – 22 mm	–	36258.100
	22 – 30 mm	–	36259.100
SK	3 – 8 mm	–	36696.002
	4 – 13.5 mm	–	36700.002
	10 – 20 mm	–	36704
	15 – 32 mm	–	36708
PU	10	10	10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 30 mm C-rails using the SC mounting foot (included in the shipment).

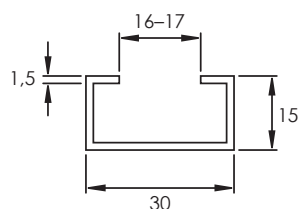
Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

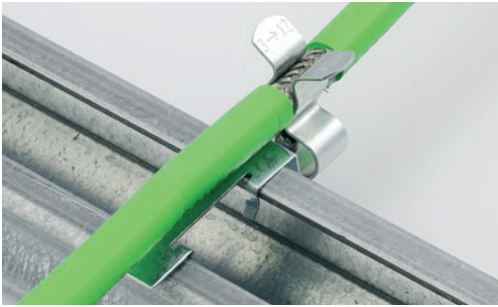
Material

- MSKL-clamp: Spring steel, zinc plated
- SKL-clamp: Sheet steel, galvanically zinc plated
- LF foot: Sheet steel, galvanically zinc plated
- Fixing hole M4
- SC foot: Sheet steel, galvanically zinc plated
- SK-bracket: Sheet steel, galvanically zinc plated

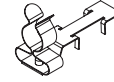


C-rail dimensions (mm)

EMC shield clamps for cable clamps for 30 mm C-rails



LFC|MSKL



		LFC MSKL	LFC SKL
Clamping range		Order No.	Order No.
MSKL	3 – 12 mm	37670.100	–
	8 – 18 mm	37671.100	–
SKL	17 – 22 mm	–	37672.100
	22 – 30 mm	–	37673.100
PU		10	10

Product description

The LFC shield clamp offers a space-saving solution for mounting on the C-rail.

The shield clamp LFC contacts the cable shield directly on the C-rail while the use of the existing cable clamp provides the strain relief.

4.1

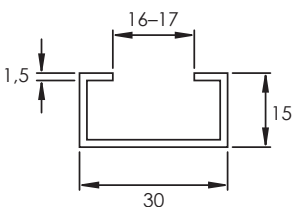
Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Advantages & benefits

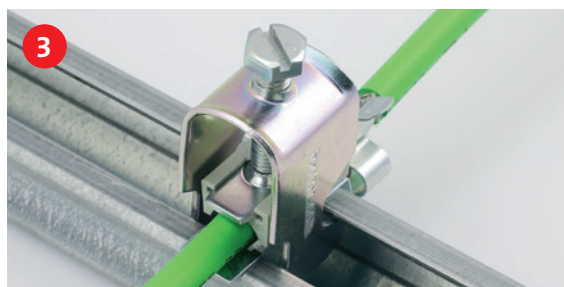
- Suitable for clamps that are mounted on C-rails
- Easy, tool-free assembly
- Space-saving assembly
- Large clamping range 3 – 30 mm
- Large cable shield contact area
- Shield contacting and strain relief are separated from each other
- For mounting on all common C-rails with an opening dimension of 16–17 mm

Specifications

Material Spring steel galvanised



C-rail dimensions (mm)

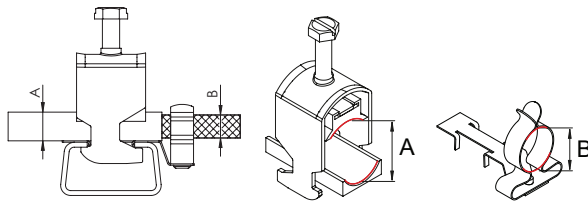




RoHS compliant

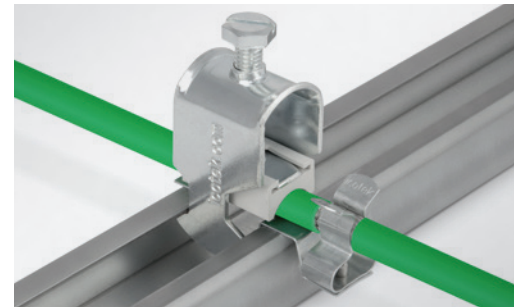


Product set of EMC shield clamps and cable clamps for 30 mm C-rails



Clamping ranges

Type	Clamping range A Cable clamp (Ø on the cable sheath)	Clamping range B Shield clamp (Ø on the cable shield)	Order No.	PU
CC-LFC 6-13 MSKL 3-12	6 – 13 mm	3 – 12 mm	37680	10
CC-LFC 12-19 MSKL 8-18	12 – 19 mm	8 – 18 mm	37681	10
CC-LFC 18-23 SKL 17-22	18 – 23 mm	17 – 22 mm	37682	10
CC-LFC 23-32 SKL 22-30	23 – 32 mm	22 – 30 mm	37683	10
CC-LFC 32-38 SKL 30-38	32 – 38 mm	30 – 38 mm	37688	10
CC-LFC 38-42 SKL 30-38	38 – 42 mm	30 – 38 mm	37684	10
CC-LFC 42-50 SKL 38-48	42 – 50 mm	38 – 48 mm	37685	10
CC-LFC 50-64 SKL 44-56	50 – 64 mm	44 – 56 mm	37686	10
CC-LFC 50-64 SKL 56-68	50 – 64 mm	56 – 68 mm	37687	10



CC-LFC|MSKL

Product description

Convenient product set consisting of the LFC EMC shield clamp for contacting the cable shield and discharging interference currents in combination with the matching CCL cable clamp for strain relief on the cable jacket.

The combination of two products helps to save space and material in the enclosure. The EMC connection of the cables no longer has to be made via an additional DIN rail or bus bar.

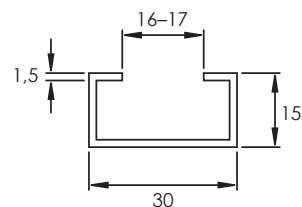
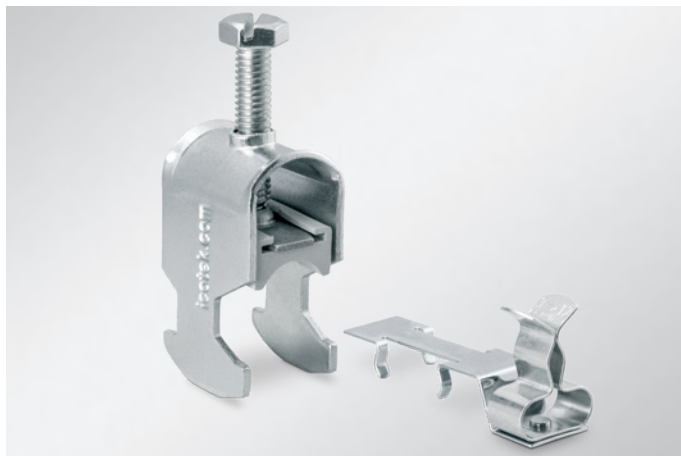
4.1

Advantages & benefits

- Space-saving due to the combination of the LFC shield clamp with the CCL cable clamp
- Quick and easy assembly
- Large variety of clamping areas
- Large cable shield contact area
- Shield contacting and strain relief are separated from each other
- For mounting on all common C-rails with an opening dimension of 16–17 mm

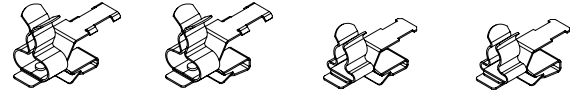
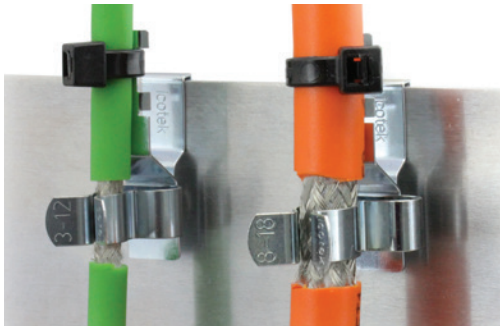
Specifications

Material LFC: Spring steel galvanised
Cable clamp: Steel galvanised



C-rail dimensions (mm)

EMC shield clamps for assembly on sheet edges with strain relief function



PFKZ-A-M/MSKL for sheet thickness 1.5 – 2 mm
 PFKZ-B-M/MSKL for sheet thickness 2 – 3 mm
 PFKZ-A/SKL for sheet thickness 1.5 – 2 mm
 PFKZ-B/SKL for sheet thickness 2 – 3 mm

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp Spring steel, zinc plated
 PFKZ foot Spring steel

Type A: For wall/sheet thickness 1.5 – 2 mm
 Type B: For wall/sheet thickness 2 – 3 mm

	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37640	37650	–	–
	8 – 18 mm	37642	37652	–	–
SKL	1.5 – 3 mm	–	–	36779.1	36783.1
	3 – 6 mm	–	–	36779.2	36783.2
	6 – 8 mm	–	–	36779.3	36783.3
	8 – 11 mm	–	–	36779.4	36783.4
	11 – 17 mm	–	–	NEW 36779.5	NEW 36783.5
	17 – 22 mm	–	–	NEW 36779.6	NEW 36783.6
	22 – 30 mm	–	–	NEW 36779.7	NEW 36783.7
PU		10	10	10	10



Made in Germany

RoHS compliant



EMC shield clamps for assembly on sheet edges without strain relief function



PFK-A|SKL for sheet thickness 1.5 – 2 mm

PFK-B|SKL for sheet thickness 2 – 3 mm



SKL	Clamping range	Order No.	Order No.
	1.5 – 3 mm	36778.1	36782.1
3 – 6 mm	36778.2	36782.2	
6 – 8 mm	36778.3	36782.3	
8 – 11 mm	36778.4	36782.4	
11 – 17 mm	NEW 36778.5	NEW 36782.5	
17 – 22 mm	NEW 36778.6	NEW 36782.6	
22 – 30 mm	NEW 36778.7	NEW 36782.7	
PU	10	10	

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

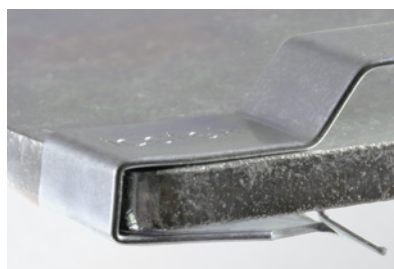
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

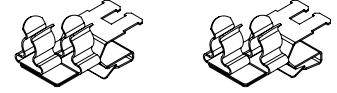
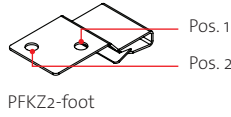
SKL-clamp Spring steel, zinc plated
 PFK foot Spring steel

Type A: For wall/sheet thickness 1.5 – 2 mm
 Type B: For wall/sheet thickness 2 – 3 mm



Secure grip on metal sheets due to mounting claws

EMC double shield clamps for assembly on sheet edges with strain relief function



PFKZ2-A|SKL for sheet thickness 1.5 – 2 mm

PFKZ2-B|SKL for sheet thickness 2 – 3 mm

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

4.1

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp Spring steel, zinc plated
PFKZ2 foot Spring steel

Type A: For wall/sheet thickness 1.5 – 2 mm
Type B: For wall/sheet thickness 2 – 3 mm

	Clamping range Pos. 1	Clamping range Pos. 2	Order No.	Order No.
SKL	blank	1.5 – 3 mm	36781.01	36785.01
	blank	3 – 6 mm	36781.02	36785.02
	blank	6 – 8 mm	36781.03	36785.03
	blank	8 – 11 mm	36781.04	36785.04
	1.5 – 3 mm	blank	36781.10	36785.10
	1.5 – 3 mm	1.5 – 3 mm	36781.11	36785.11
	1.5 – 3 mm	3 – 6 mm	36781.12	36785.12
	1.5 – 3 mm	6 – 8 mm	36781.13	36785.13
	1.5 – 3 mm	8 – 11 mm	36781.14	36785.14
	3 – 6 mm	blank	36781.20	36785.20
	3 – 6 mm	1.5 – 3 mm	36781.21	36785.21
	3 – 6 mm	3 – 6 mm	36781.22	36785.22
	3 – 6 mm	6 – 8 mm	36781.23	36785.23
	3 – 6 mm	8 – 11 mm	36781.24	36785.24
PU	6 – 8 mm	blank	36781.30	36785.30
	6 – 8 mm	1.5 – 3 mm	36781.31	36785.31
	6 – 8 mm	3 – 6 mm	36781.32	36785.32
	6 – 8 mm	6 – 8 mm	36781.33	36785.33
	6 – 8 mm	8 – 11 mm	36781.34	36785.34
	8 – 11 mm	blank	36781.40	36785.40
	8 – 11 mm	1.5 – 3 mm	36781.41	36785.41
	8 – 11 mm	3 – 6 mm	36781.42	36785.42
	8 – 11 mm	6 – 8 mm	36781.43	36785.43
				10

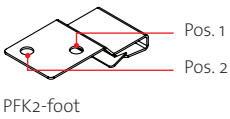


Made in Germany

RoHS compliant



EMC double shield clamps for assembly on sheet edges without strain relief function



PFK2-A|SKL for sheet thickness 1.5 – 2 mm

PFK2-B|SKL for sheet thickness 2 – 3 mm

Clamping range Pos. 1	Clamping range Pos. 2	Order No.	Order No.
blank	1.5 – 3 mm	36780.01	36784.01
blank	3 – 6 mm	36780.02	36784.02
blank	6 – 8 mm	36780.03	36784.03
blank	8 – 11 mm	36780.04	36784.04
1.5 – 3 mm	blank	36780.10	36784.10
1.5 – 3 mm	1.5 – 3 mm	36780.11	36784.11
1.5 – 3 mm	3 – 6 mm	36780.12	36784.12
1.5 – 3 mm	6 – 8 mm	36780.13	36784.13
1.5 – 3 mm	8 – 11 mm	36780.14	36784.14
3 – 6 mm	blank	36780.20	36784.20
3 – 6 mm	1.5 – 3 mm	36780.21	36784.21
3 – 6 mm	3 – 6 mm	36780.22	36784.22
3 – 6 mm	6 – 8 mm	36780.23	36784.23
3 – 6 mm	8 – 11 mm	36780.24	36784.24
6 – 8 mm	blank	36780.30	36784.30
6 – 8 mm	1.5 – 3 mm	36780.31	36784.31
6 – 8 mm	3 – 6 mm	36780.32	36784.32
6 – 8 mm	6 – 8 mm	36780.33	36784.33
6 – 8 mm	8 – 11 mm	36780.34	36784.34
8 – 11 mm	blank	36780.40	36784.40
8 – 11 mm	1.5 – 3 mm	36780.41	36784.41
8 – 11 mm	3 – 6 mm	36780.42	36784.42
8 – 11 mm	6 – 8 mm	36780.43	36784.43
PU		10	10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

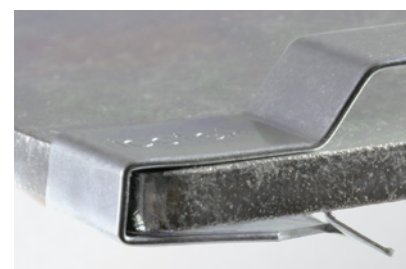
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp Spring steel, zinc plated
PFK2 foot Spring steel

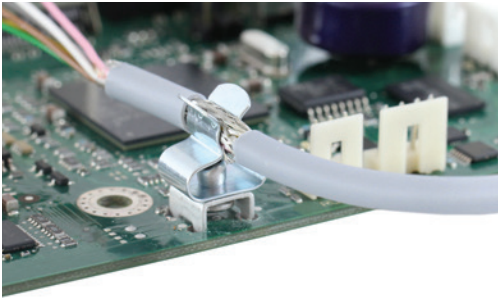
Type A: For wall/sheet thickness 1.5 – 2 mm
Type B: For wall/sheet thickness 2 – 3 mm



Secure grip on metal sheets due to mounting claws

PCB|SKL

EMC Shield clamps
for printed circuit boards



Product description

PCB|SKL shield clamps are easy to use and effective in earthing single cable shields.

PCB|SKL consist of SKL clamps, fixed on a soldering foot that enables assembly on printed circuit boards. There are various designs to choose from.

4.1

Advantages & benefits

- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Large contact area

Specifications

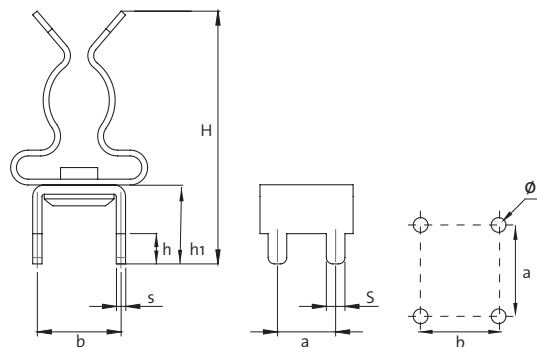
Material

SKL-clamp Spring steel, zinc plated
PCB-foot Brass, tin plated

SKL-clamp

PCB-ET-4-V-4,1|SKL 3-6 Spring steel, tin plated

Type	Order No.	Height H [mm]	Height h1 [mm]	Width s [mm]	Pin h [mm]	Pin S [mm]	Grid a x b [mm]	Drill-hole d [mm]	PU
PCB-4-V-6,8 SKL 1.5-3 Clamping range 1.5 - 3 mm	36650.1	20	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-6,8 SKL 3-6 Clamping range 3 - 6 mm	36650.2	20	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-6,8 SKL 6-8 Clamping range 6 - 8 mm	36650.3	22	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 1.5-3 Clamping range 1.5 - 3 mm	36656.1	25	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 3-6 Clamping range 3 - 6 mm	36656.2	26	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 6-8 Clamping range 6 - 8 mm	36656.3	27	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-ET-4-V-4,1 SKL 3-6 Clamping range 3 - 6 mm (one-piece)	36653.1	17.5	4.4	0.3	2.6	1.6	5 x 7.2	Ø 1.8	25



PCB-ET-4-V-4,1|SKL 3-6

STFZ|SKL

EMC Terminal clamp for peripheral modules

Application terminal clamp

STFZ|SKL

- Bosch Rexroth
IP2o Inline Module
- PHOENIX CONTACT
All terminals of the INLINE range.
The terminals 1.4 and 2.4 must not be used for signal I/O.
- Pilz
All PSSu-Modules with shield terminals 13 and 23
- Siemens
All terminals of the ET200s range.
Terminals 4 and 8 must not be used for signal I/O.
- TURCK
For terminals of the BL2o I/O system.
- VIPA SLIO
All terminals of the SLIO range. Terminals 4+8 must not be used for signal I/O.
- WAGO
All terminals of the WAGO I/O Systems 750.
Terminals 4 and 8 must not be used for signal I/O.
- Rockwell Automation / Allen-Bradley
Series 1734

Further manufacturers upon request.

STFZ-U|SKL

- BECKHOFF
EL 3122, ES 3122, ES 9100, ES 9410, KL 1114, KS 2134
- OMRON
Series NX

STFZ-SP|SKL

- Siemens
SIMATIC ET 200SP



STFZ-U|SKL

Product description

The EMC terminal clamps STFZ|SKL combine the functions strain relief, cable guidance and earthing of signal cables. Available in two versions for 1 or 2 lines.

The STFZ2|SKL is used for analogue I/O modules using two actuators/sensors.

The STFZ EMC terminal clamp is compatible to bus modules listed on the left side.

For the SIMATIC ET 200SP module by Siemens icotek has developed a special terminal clamp STFZ-SP for 1 or 2 lines.

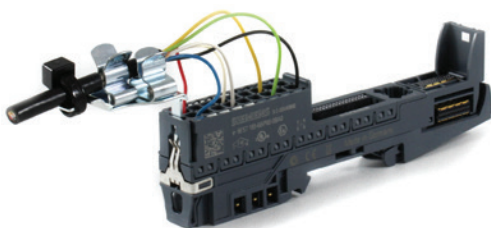
4.1



STFZ I/O Insert Tool

STFZ I/O Insert Tool for quick and easy mounting of STFZ terminal clamps.

Order No. 61430



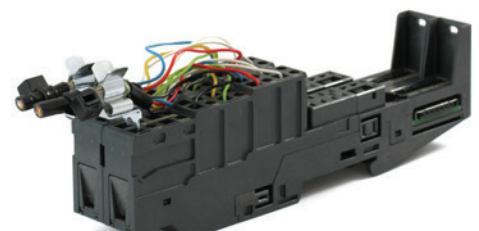
STFZ-SP|SKL



STFZ-U|SKL

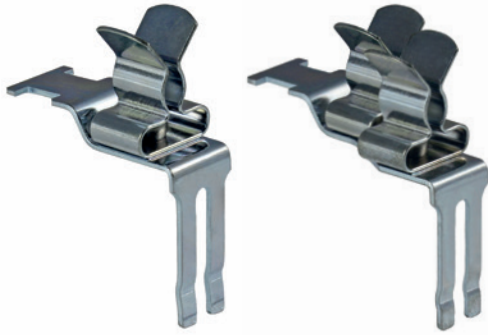


STFZ|SKL



STFZ | STFZ2

EMC Terminal clamp, single and double for various brands



Product description

The STFZ|SKL EMC terminal clamp provides strain relief, cable guidance and earthing for decentralised bus modules (see compatibility table page 177).

4.1 The STFZ2|SKL is used for analogue I/O modules using two actuators / sensors.

The EMC shield clamps as listed below are available to mount:
SKL 1.5-3 | SKL 3-6 | SKL 6-8

Advantages & benefits

- Earthing of signal cables close to the terminal
- Strain relief and cable management directly on the bus module

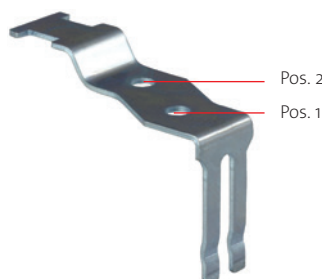
Specifications

Material	
SKL-clamp	Spring steel, zinc plated
STFZ-foot	Spring steel

Accessories

STFZ I/O Insert Tool 177

Type	Shield diameter Pos. 1	Shield diameter Pos. 2	Order No.	PU
STFZ SKL with one shield clamp:				
STFZ SKL 1.5-3	1.5 - 3 mm	-	37510.1	10
STFZ SKL 3-6	3 - 6 mm	-	37510.2	10
STFZ SKL 6-8	6 - 8 mm	-	37510.3	10
STFZ2 SKL with two shield clamps:				
STFZ2 01	blank	1.5 - 3 mm	37505.01	10
STFZ2 02	blank	3 - 6 mm	37505.02	10
STFZ2 03	blank	6 - 8 mm	37505.03	10
STFZ2 10	1.5 - 3 mm	blank	37505.10	10
STFZ2 11	1.5 - 3 mm	1.5 - 3 mm	37505.11	10
STFZ2 12	1.5 - 3 mm	3 - 6 mm	37505.12	10
STFZ2 13	1.5 - 3 mm	6 - 8 mm	37505.13	10
STFZ2 20	3 - 6 mm	blank	37505.20	10
STFZ2 21	3 - 6 mm	1.5 - 3 mm	37505.21	10
STFZ2 22	3 - 6 mm	3 - 6 mm	37505.22	10
STFZ2 23	3 - 6 mm	6 - 8 mm	37505.23	10
STFZ2 30	6 - 8 mm	blank	37505.30	10
STFZ2 31	6 - 8 mm	1.5 - 3 mm	37505.31	10
STFZ2 32	6 - 8 mm	3 - 6 mm	37505.32	10
STFZ2 33	6 - 8 mm	6 - 8 mm	37505.33	10





Made in Germany

RoHS compliant



STFZ-U | STFZ-SP | STFZ2-SP

EMC Terminal clamp, single and double for Siemens & Beckhoff modules



STFZ-SP|SKL

STFZ2-SP|SKL

Type	Shield diameter Pos. 1	Shield diameter Pos. 2	Order No.	PU
STFZ-SP SKL / STFZ-U SKL with one shield clamp:				
STFZ-SP SKL 1.5-3	1.5 - 3 mm	-	37512.1	10
STFZ-U SKL 1.5-3	1.5 - 3 mm	-	37514.1	10
STFZ-SP SKL 3-6	3 - 6 mm	-	37512.2	10
STFZ-U SKL 3-6	3 - 6 mm	-	37514.2	10
STFZ-SP SKL 6-8	6 - 8 mm	-	37512.3	10
STFZ-U SKL 6-8	6 - 8 mm	-	37514.3	10
STFZ2-SP with two shield clamps:				
STFZ2-SP 01	blank	1.5 - 3 mm	37507.01	10
STFZ2-SP 02	blank	3 - 6 mm	37507.02	10
STFZ2-SP 03	blank	6 - 8 mm	37507.03	10
STFZ2-SP 10	1.5 - 3 mm	blank	37507.10	10
STFZ2-SP 11	1.5 - 3 mm	1.5 - 3 mm	37507.11	10
STFZ2-SP 12	1.5 - 3 mm	3 - 6 mm	37507.12	10
STFZ2-SP 13	1.5 - 3 mm	6 - 8 mm	37507.13	10
STFZ2-SP 20	3 - 6 mm	blank	37507.20	10
STFZ2-SP 21	3 - 6 mm	1.5 - 3 mm	37507.21	10
STFZ2-SP 22	3 - 6 mm	3 - 6 mm	37507.22	10
STFZ2-SP 23	3 - 6 mm	6 - 8 mm	37507.23	10
STFZ2-SP 30	6 - 8 mm	blank	37507.30	10
STFZ2-SP 31	6 - 8 mm	1.5 - 3 mm	37507.31	10
STFZ2-SP 32	6 - 8 mm	3 - 6 mm	37507.32	10
STFZ2-SP 33	6 - 8 mm	6 - 8 mm	37507.33	10

Product description

The STFZ-SP|SKL EMC terminal clamp provides strain relief, cable guidance and earthing for decentralised bus modules SIMATIC ET 200SP by Siemens. STFZ2-SP|SKL is a version for analogue I/O modules using two actuators/sensors. STFZ-U terminal clamps for various Beckhoff modules see page 177.

The EMC shield clamps as listed below are available to mount:
SKL 1.5-3 | SKL 3-6 | SKL 6-8

Advantages & benefits

- Earthing of signal cables close to the terminal
- Strain relief and cable management directly on the bus module

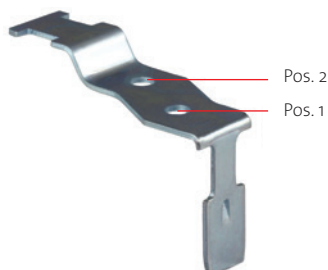
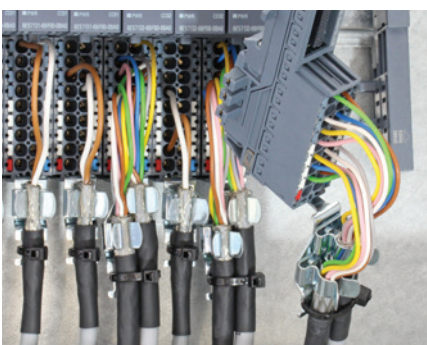
Specifications

Material

SKL-clamp Spring steel, zinc plated
STFZ-SP-foot Spring steel

Accessories

STFZ I/O Insert Tool 177



STFZ-U|SKL

EMC ServiceBox *multi*

Service box with assorted MSKL shield clamp



90% of all cable shields are contacted

Product description

The suitable EMC clamp is always readily available!

The EMC ServiceBox multi is very universal, especially when the cable diameter is unknown in advance. With the new ServiceBox multi you always have the right size on hand.

The EMC ServiceBox multi is perfect for installations and service calls. Retrofitting and maintenance can be carried out easily and quickly.

Order No. 880o6

Content*

MSKL / SKL for TS35 DIN rails:	
Type SFZ-M MSKL - sizes: 8 - 18 mm	10 × MSKL
Type SFZ-M MSKL - sizes: 3 - 12 mm	20 × MSKL
Type SFZ SKL - sizes: 1.5 - 3 mm	10 × SKL
MSKL / SKL for assembly via screws:	
Type LFZ-M MSKL - sizes: 8 - 18 mm	10 × MSKL
Type LFZ-M MSKL - sizes: 3 - 12 mm	20 × MSKL
Type LFZ SKL - sizes: 1.5 - 3 mm	10 × SKL
MSKL for 10 × 3 mm bus bar:	
Type PFSZ-M MSKL - sizes: 3 - 12 mm	10 × MSKL
MSKL / SKL for clipping on metal sheets:	
Type PFKZ-B-M MSKL - sizes: 1.5 - 8 mm	10 × MSKL
Type PFKZ-B SKL 22	2 × SKL
SKL for decentralised bus modules:	
Type STFZ SKL - sizes: 3 - 6 mm	6 × SKL
SKL for clipping on metal sheets	
Typ PFKZ-B SKL 1.5-3 mm	3 × SKL
Typ PFKZ-B SKL 3-6 mm	3 × SKL
Typ PFKZ-B SKL 6-8 mm	3 × SKL
EMC - Accessories:	
RLFZ - Clamp assembly 5× SKL	1 piece



* Subject to alterations



Made in Germany

RoHS compliant



EMC ServiceBox

Service box with assorted SKL shield clamps



Exact gradations of the shield clamps



Product description

The suitable EMC clamp is always readily available!

The EMC ServiceBox is perfect for installations and service calls. Retrofitting and maintenance can be carried out easily and quickly

Order No. 88002

Content*

SKL for TS35 DIN rails:

- Type SFZ|SKL - sizes: 1.5 - 17 mm 15 × SKL
- Type SFS|SKL - sizes: 1.5 - 8 mm 6 × SKL
- SFZ-M|MSKL - sizes: 3-18 mm 4 × SKL

SKL for assembly via screws:

- Type LFZ|SKL - sizes: 1.5 - 17 mm 21 × SKL
- Type LFZ-U4|SKL - sizes: 1.5-11 mm 8 × SKL
- Type LFZ-M|MSKL - sizes: 3-18 mm 4 × SKL

SKL for 10 × 3 bus bar:

- Type PFSZ2|SKL 11 1 × SKL
- Type PFSZ2|SKL 22 1 × SKL
- Type PFSZ2|SKL 33 1 × SKL

SKL for clipping on metal sheets:

- Type PFSZ|SKL - sizes: 1.5 - 11 mm 15 × SKL
- Type PFSZ-M|MSKL - sizes: 3-18 mm 4 × SKL

SKL for decentralised bus modules:

- STFZ|SKL - sizes: 3 - 6 mm 1 × SKL
- STFZ2|SKL 23 1 × SKL

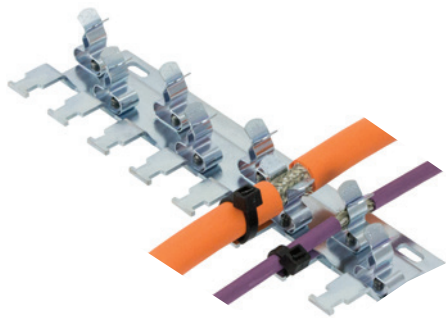
SKL for Siemens module ET 200 SP:

- STFZ-SP|SKL - sizes: 3-6 mm 1 × SKL
- STFZ2-SP|SKL 23 1 × SKL

* Subject to alterations

RLFZ-M | SC|RLFZ-M

EMC Clamp assembly with strain relief and a large clamping range



for screw mounting

Product description

The RLFZ-M range is a further development of the EMC clamp assembly which enables earthing and strain relief of up to 12 cable shields from 3-12 mm using only one shield clamp size.

4.1

There are 10 different carriers available which can be easily user configured with up to 12 MSKL 3-12 shield clamps.

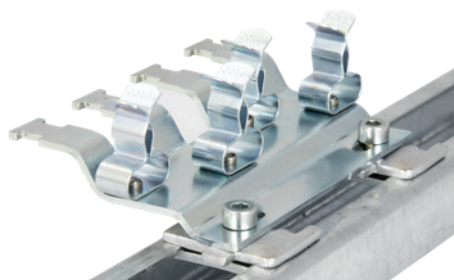
Advantages & benefits

- Easy storage due to large clamping range 3-12 mm
- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Online design tool for EMC Clamp assembly on www.icotek.com

Specifications

Material

MSKL-clamp	Spring steel, zinc plated
RLFZ-M-foot	Sheet steel, galvanically zinc plated
SC-foot	Sheet steel, galvanically zinc plated



Type SC: Mounted on screw-foot for DIN-rail shape C



SC foot single for C-rail
PU: 10, Order No. 36220

Type	Order No. for direct mounting	Order No. for C-rails*	Number of shield clamps	Length	Width	PU
RLFZ-M (x2)	38069.002	–	2× MSKL 3-12	36 mm	54.1 mm	1
RLFZ-M (x3)	38070.002	38070.100	3× MSKL 3-12	52 mm	54.1 mm	1
RLFZ-M (x4)	38071.002	38071.100	4× MSKL 3-12	73 mm	54.1 mm	1
RLFZ-M (x5)	38072.002	38072.100	5× MSKL 3-12	94 mm	54.1 mm	1
RLFZ-M (x6)	38073.002	38073.100	6× MSKL 3-12	115 mm	54.1 mm	1
RLFZ-M (x7)	38074.002	38074.100	7× MSKL 3-12	136 mm	54.1 mm	1
RLFZ-M (x8)	38075.002	38075.100	8× MSKL 3-12	157 mm	54.1 mm	1
RLFZ-M (x9)	38076.002	38076.100	9× MSKL 3-12	178 mm	54.1 mm	1
RLFZ-M (x10)	38077.002	38077.100	10× MSKL 3-12	199 mm	54.1 mm	1
RLFZ-M (x11)	38078.002	38078.100	11× MSKL 3-12	220 mm	54.1 mm	1
RLFZ-M (x12)	38079.002	38079.100	12× MSKL 3-12	241 mm	54.1 mm	1



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com



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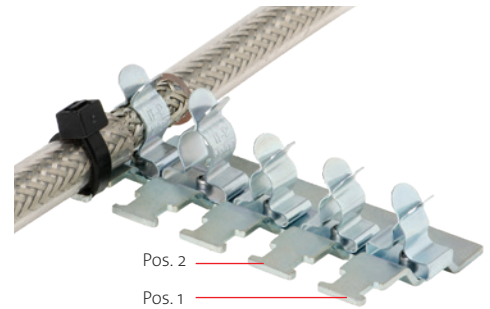
RoHS compliant



RLFZ | SC|RLFZ EMC Clamp assembly with strain relief



Type	Order No. for direct mounting	Order No. for C-rails*	Number of shield clamps	Length	Width	PU
RLFZ (x3)	38005	38005.100	3× SKL	41.2 mm	44.4 mm	1
RLFZ (x4)	38010	38010.100	4× SKL	56.8 mm	44.4 mm	1
RLFZ (x5)	38015	38015.100	5× SKL	72.4 mm	44.4 mm	1
RLFZ (x6)	38020	38020.100	6× SKL	88 mm	44.4 mm	1
RLFZ (x7)	38025	38025.100	7× SKL	103.6 mm	44.4 mm	1
RLFZ (x8)	38030	38030.100	8× SKL	119.2 mm	44.4 mm	1
RLFZ (x9)	38035	38035.100	9× SKL	134.8 mm	44.4 mm	1
RLFZ (x10)	38040	38040.100	10× SKL	150.4 mm	44.4 mm	1
RLFZ (x11)	38045	38045.100	11× SKL	166 mm	44.4 mm	1
RLFZ (x12)	38050	38050.100	12× SKL	181.6 mm	44.4 mm	1



for screw mounting

Product description

The RLFZ range enables earthing and strain relief of up to 12 cables in a small space.

The combination of EMC shield earthing and strain relief is the key feature of this system.

There are 10 different carriers available which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

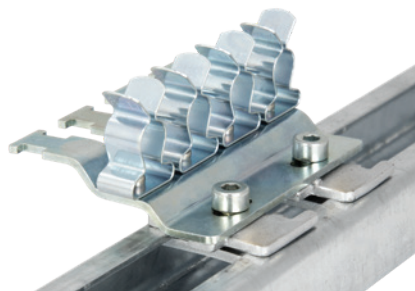
Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Online design tool for EMC Clamp assembly

Specifications

Material

SKL-clamp	Spring steel, zinc plated
RLFZ-foot	Carbon steel, galvanically zinc plated
SC-foot	Carbon steel, galvanically zinc plated



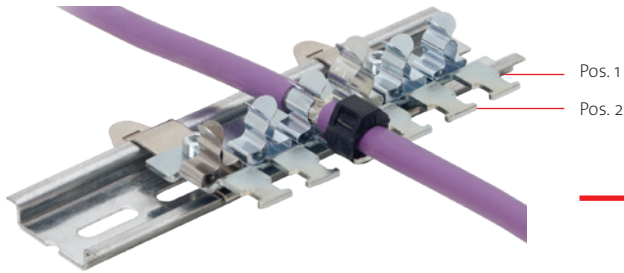
Type SC: Mounted on screw-foot for DIN-rail shape C*



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

SF|RLFZ

EMC Clamp assembly for 35 mm DIN rail



Type	Order No. (unfitted)	Number of shield clamps	Length	Width	PU
SF RLFZ (x3)	38105	3× SKL	41.2 mm	70.7 mm	1
SF RLFZ (x4)	38110	4× SKL	56.8 mm	70.7 mm	1
SF RLFZ (x5)	38115	5× SKL	72.4 mm	70.7 mm	1
SF RLFZ (x6)	38120	6× SKL	88 mm	70.7 mm	1
SF RLFZ (x7)	38125	7× SKL	103.6 mm	70.7 mm	1
SF RLFZ (x8)	38130	8× SKL	119.2 mm	70.7 mm	1
SF RLFZ (x9)	38135	9× SKL	134.8 mm	70.7 mm	1
SF RLFZ (x10)	38140	10× SKL	150.4 mm	70.7 mm	1
SF RLFZ (x11)	38145	11× SKL	166 mm	70.7 mm	1
SF RLFZ (x12)	38150	12× SKL	181.6 mm	70.7 mm	1

Product description

The SF|RLFZ range is based upon the RLFZ clamp assembly, which is mounted on snap feet for 35 mm DIN rails shape H.

4.1 There are 10 different carriers available, which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:
SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Simple and tool-free mounting, easy assembly
- configure online on www.icotek.com

Specifications

Material

- SKL-clamp Spring steel, zinc plated
- RLFZ-foot Sheet steel, galvanically zinc plated



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com



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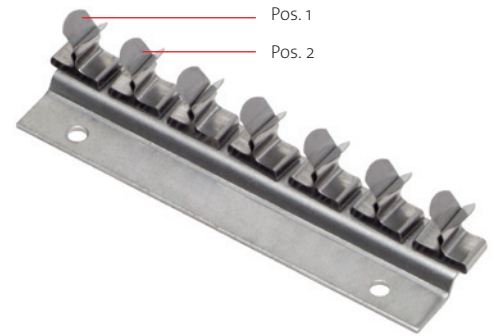
RoHS compliant



RLF EMC Clamp assembly



Type	Order No. (unfitted)	Number of shield clamps	Length	Width	PU
RLF (x3)	36965	3× SKL	46.2 mm	24 mm	1
RLF (x4)	36984	4× SKL	60.8 mm	24 mm	1
RLF (x5)	36958	5× SKL	72.4 mm	24 mm	1
RLF (x6)	36952	6× SKL	88 mm	24 mm	1
RLF (x7)	36963	7× SKL	103.6 mm	24 mm	1
RLF (x8)	36953	8× SKL	119.2 mm	24 mm	1
RLF (x9)	36985	9× SKL	140.8 mm	24 mm	1
RLF (x10)	36954	10× SKL	150.4 mm	24 mm	1
RLF (x11)	36955	11× SKL	166 mm	24 mm	1
RLF (x12)	36962	12× SKL	181.6 mm	24 mm	1



Product description

Comparable with the RLFZ clamp assembly, just without strain relief.

There are 10 different carriers available which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Online design tool for EMC Clamp assembly

Specifications

Material

SKL-clamp Spring steel, zinc plated
 RLF-foot Stainless steel

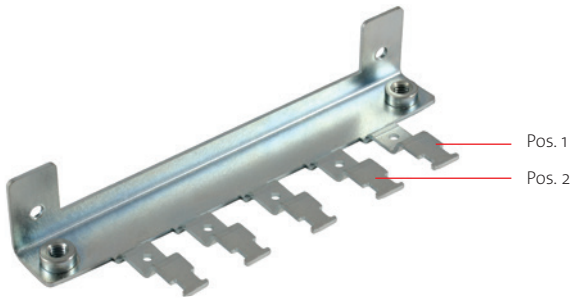
4.1



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

KEL-EMC-Z

Cable assembly with strain relief



Type	Order No.	No. of teeth	Fastening	Fits with	PU
KEL-EMC-Z 16 4	36525	4	long side	KEL-(ER-)E4 KEL 16 x KEL-U 16 x KEL-ER 16 x KEL-QUICK 16	1
KEL-EMC-Z 24 5	36527	5	long side	KEL-(ER-)E5 KEL 24 x KEL-U 24 x KEL-ER 24 x KEL-QUICK 24	1

Product description

Cable entry, EMC shield earthing and strain relief – all in one location!

Cables pass through the KEL cable entry frame and lead directly to the EMC clamps and strain relief.

Simply insert the cable shield into the shield clamp and secure the cable jacket to the strain relief. Two separate functions (according to regulations) carried out quickly and easily!

Custom configurations are available for shield clamps up to 16 mm in diameter with minimal order quantities and lead time.

4.1

Advantages & benefits

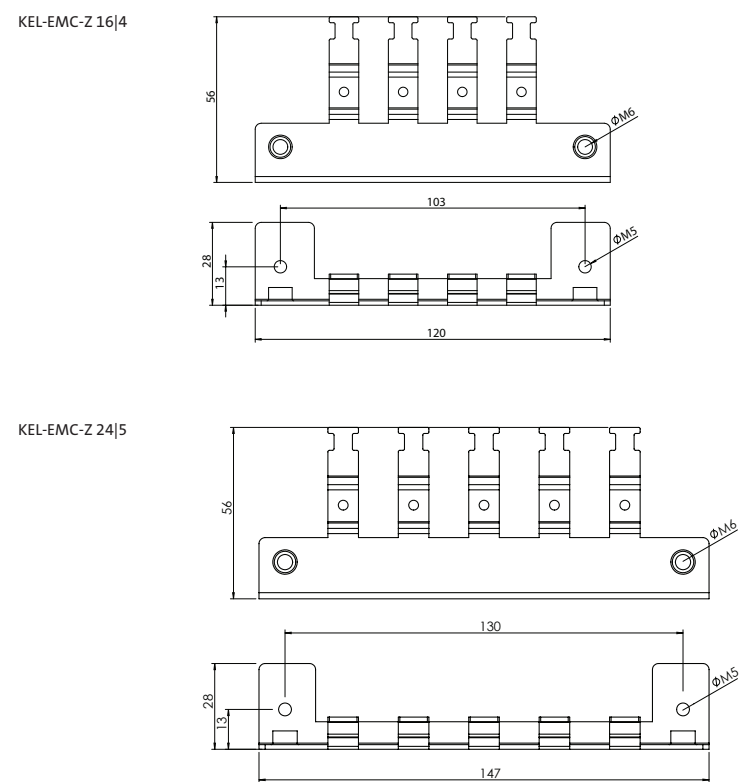
- Large surface contact between cable shield and housing, especially on conductive coated surfaces
- Sealing by outer cable jacket – EMC earthing by cable shield (in acc. with regulations)
- Easily combines cable routing, EMC and strain relief due to the use of the same mounting holes
- Available without SKL shield clamps if only additional strain relief is required
- Mounting hole for earthing tape or PE connection

Specifications

Material Sheet steel, zinc plated

Compatible with

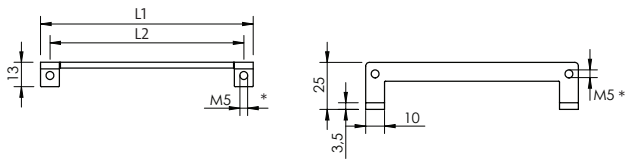
KEL-U Cable entry frames	12 - 14
KEL-ER Cable entry frames	8 - 11
KEL Cable entry frames	16 - 19
KEL-QUICK Cable entry frames	69 - 71



RoHS
compliant

KEL-EMC-PF

Cable assembly, bracket version



Type	Fits with	Order No.	Length L1	Length L2	PU
KEL-EMC-PFM 10	KEL(-U) 10 x KEL-QUICK 10 x KEL-ER 10 x	39184	93 mm	83 mm	1
KEL-EMC-PFM 16	KEL(-U) 16 x KEL-QUICK 16 x KEL-ER 16 x KEL-DPZ 16 x	39183	113 mm	103 mm	1
KEL-EMC-PFM 24	KEL(-U) 24 x KEL-QUICK 24 x KEL-ER 24 x KEL-DPZ 24 x KEL-DPU 24 x	39181	140 mm	130 mm	1
KEL-EMC-PF B4	KEL(-ER)-E2 KEL-QUICK-E2 KEL(-U)-B KEL-QUICK-B KEL-ER-B	39150	68 mm	58 mm	1
KEL-EMC-PF 10	KEL(-ER)-E3 KEL-QUICK-E3 KEL(-U) 10 x KEL-QUICK 10 x KEL-ER 10 x	39160	93 mm	83 mm	1
KEL-EMC-PF 16	KEL(-ER)-E4 KEL-QUICK-E4 KEL(-U) 16 x KEL-QUICK 16 x KEL-ER 16 x KEL-DPZ 16 x	39170	113 mm	103 mm	1
KEL-EMC-PF 24	KEL(-ER)-E5 KEL-QUICK-E5 KEL(-U) 24 x KEL-QUICK 24 x KEL-ER 24 x KEL-DPZ 24 x KEL-DPZ-E KEL-DPU 24 x	39180	140 mm	130 mm	1
KEL-EMC-PF 183	KEL 183 KEL 183-E	39190	200 mm	95 / 190 mm	1



Product description

The EMC bracket combined with the matching PFS|SKL EMC shield clamp is perfect in conjunction with the KEL cable entry frame for alleviating interferences due to shields.

The EMC clamp is assembled inside the control panel. For this process the fixing screws for the assembly of the KEL frame on the panel are used. A female screw thread M5 is already integrated in the KEL-EMC-PF bracket.

Depending on the cable diameter, the corresponding PFS|SKL EMC shield clamp can be snapped onto the EMC bracket.

Advantages & benefits

- Supports a wide range of cable and wire sizes
- Large surface contact of the cable shield
- Permanent spring pressure on the cable shield
- Fast and easy assembly

Specifications

Material Sheet steel, galvanically zinc plated

Compatible with

KEL-U Cable entry frames	12 - 14
KEL-ER Cable entry frames	8 - 11
KEL Cable entry frames	16 - 19
KEL 183 Cable entry frames	26
KEL-QUICK Cable entry frames	69 - 71
KEL-BES Brush frames	254
KEL-DPU Cable entry plates	100 - 101
KEL-DPZ Cable entry plates	102 - 113
PFSZ SKL / PFSZ-M MSKL Shield clamps	164
PFS SKL Shield clamps	165



KEL-EMC-PF

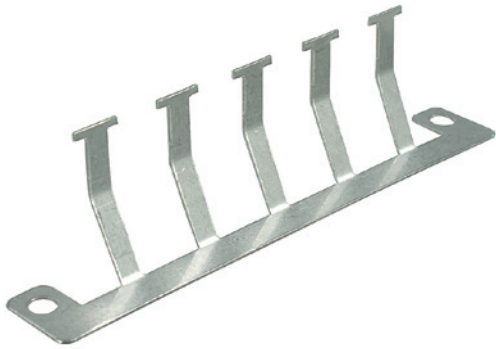


KEL-EMC-PFM

* M5 thread only applies to KEL-EMV-PF

KEL-EMC

Cable assembly



Type	Order No.	No. of teeth	Fastening	Fits with	PU
KEL-EMC-B	36520	2	long side	KEL-E2 KEL(-U)-B x KEL-ER-B x KEL-QUICK-B2 B4	5
KEL-EMC 10	36522	3	long side	KEL-E3 KEL(-U) 10 x KEL-ER 10 x	5
KEL-EMC 16 4	36524	4	long side	KEL-E4 KEL(-U) 16 x KEL-ER 16 x KEL-QUICK 16	5
KEL-EMC 24 5	36526	5	long side	KEL-E5 KEL(-U) 24 x KEL-ER 24 x KEL-QUICK 24	5
KEL-EMC F	39110	3	long side	KEL(-U)-B x KEL-ER-B x KEL(-U) 10 x KEL-ER 10 x KEL(-U) 16 x KEL-ER 16 x KEL(-U) 24 x KEL-ER 24 x	5

Product description

Installation of pre-terminated cables without shield interruption.

Advantages & benefits

4.1

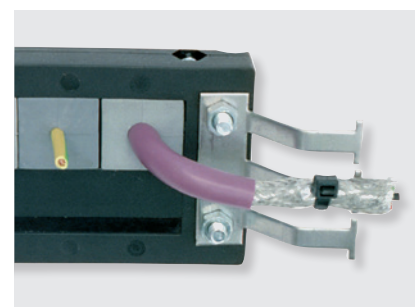
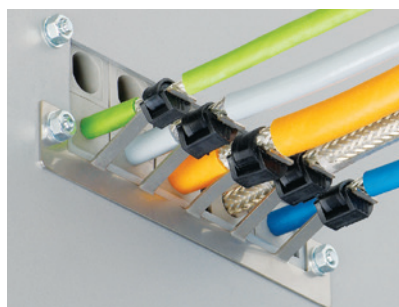
- Direct, easy and quick contact to the enclosure
- Space saving, usable for up to 10 cables with the two row model
- Alternative to EMC cable glands, even for pre-terminated cables
- Low resistance shield contact

Specifications

Material Stainless steel

Compatible with

- KEL-U Cable entry frames 12 - 14
- KEL-ER Cable entry frames 8 - 11
- KEL Cable entry frames 16 - 19
- KEL-QUICK Cable entry frames 69 - 71
- KEL-BES Brush frames 254





Made in Germany

RoHS compliant



KVT-EMC EMC bracket for cable glands

Type	Order No.	Shield diameter	PU
KVT-EMC-25 SKL 1.5-3	37180.1	1.5 - 3 mm	5
KVT-EMC-25 SKL 3-6	37180.2	3 - 6 mm	5
KVT-EMC-25 SKL 6-8	37180.3	6 - 8 mm	5
KVT-EMC-25 SKL 8-11	37180.4	8 - 11 mm	5
KVT-EMC-32 SKL 1.5-3	37181.1	1.5 - 3 mm	5
KVT-EMC-32 SKL 3-6	37181.2	3 - 6 mm	5
KVT-EMC-32 SKL 6-8	37181.3	6 - 8 mm	5
KVT-EMC-32 SKL 8-11	37181.4	8 - 11 mm	5



Product description

The KVT-EMC brackets in combination with the split cable glands KVT and QVT combine routing, EMC shield earthing and strain relief. The connection to the earth potential is possible via the enclosure wall or an earthing tape.

Cables pass through the split cable glands and lead directly into the EMC clamps.

Separate functions (according to regulations) carried out quickly and easily!

4.1

Advantages & benefits

- Simple and tool free assembly
- Large contact area
- Subsequent assembly possible
- Additional M5 hole for earthing tape

Specifications

Material Sheet steel, zinc plated

Compatible with

KVT Split cable glands 44 - 45
 QVT Split cable glands 73 - 74



KAFM-EMC

EMC Strain relief plates

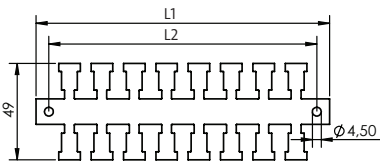


Product description

The EMC strain relief plate KAFM is practical for earthing interferences on the cable shield.

The cable assembly can be assembled on a mounting plate with screws, with SC foot on DIN-rails shape C or with SF or SK mounting foot on 35 mm DIN-rails shape H.

4.1



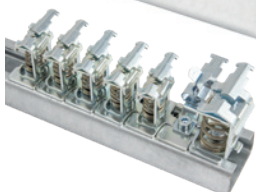
Specifications

Material Stainless steel

Type	Order No. Type SF	Order No. Type SK	Order No. Type SC	Order No. Type DH	Order No. loose rail	Length L1	Length L2	No. of teeth	PU
KAFM 2	36442	36432	36412	36482	36422	50.5	37.5	2	1
KAFM 4	36444	36434	36414	36484	36424	83.5	70.5	4	1
KAFM 6	36446	36436	36416	36486	36426	116.5	103.5	6	1
KAFM 8	36448	36438	36418	36488	36428	149.5	136.5	8	1
KAFM 10	36450	36440	36400	36490	36430	182.5	169.5	10	1
KAFM 16	36452	36470	36465	36460	36530	281.5	268.5	16	1
KAFM 29	36454	36471	36466	36462	36540	494.5	481.5	29	1
KAFM 59	36458	36472	36467	36464	36550	990	978	59	1
KAFM 59 zinc plated	36459	-	-	-	36562	990	978	59	1
SF	36230								10
									Mounting foot single, for 35 mm DIN-rail shape H
SK	36232								10
									Screw-foot single, for 35 mm DIN-rail shape H
SC	36231								10
									Screw-foot single, for 30 mm DIN-rail shape C (width of mouth: 16–17 mm) with twist protection notch
Bushing DH	36234								10
									Distance bushing 8 mm high



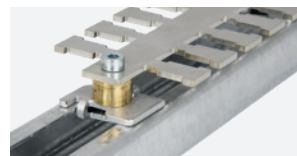
SC-foot with twist protection notch: space-saving design enables high cable density.



Mounting foot adjusts itself when tightening the screw.



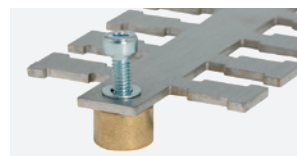
Type SF: Mounted on snap foot for DIN-rail shape H



Type SC: Mounted on screw-foot for DIN-rail shape C



Type SK: Mounted on screw-foot for DIN-rail shape H



Type DH: Mounted on bushing for flexible fixation on bottom sheet



Made in Germany

RoHS compliant



ZL|SB-EMC

Shield plate for ZL strain relief plates

Type	Model	Order No.	Fits with	Length L1	Length L2	PU
ZL 39 SB-EMC-1	single-row	36322	ZL 39	42 mm	19.5 mm	10
ZL 39 SB-EMC-2	double-row	37150	ZL 39	42 mm	19.5 mm	10
ZL 60 SB-EMC-1	single-row	36328	ZL 60	64 mm	43.5 mm	10
ZL 60 SB-EMC-2	double-row	37152	ZL 60	64 mm	43.5 mm	10
ZL 87 SB-EMC-1	single-row	36324	ZL 87	90 mm	68 mm	10
ZL 87 SB-EMC-2	double-row	37154	ZL 87	90 mm	68 mm	10
ZL 103 SB-EMC-1	single-row	36332	ZL 103	106 mm	84 mm	10
ZL 103 SB-EMC-2	double-row	37156	ZL 103	106 mm	84 mm	10
ZL 121 SB-EMC-1	single-row	36330	ZL 121	124 mm	102.5 mm	10
ZL 121 SB-EMC-2	double-row	37158	ZL 121	124 mm <td 102.5 mm	10	
ZL 140 SB-EMC-1	single-row	36326	ZL 140	142 mm	121 mm	10
ZL 140 SB-EMC-2	double-row	37159	ZL 140	142 mm	121 mm	10



Product description

The shield plates ZL|SB-EMC provide shield earthing in addition to strain relief.

Affix the corresponding shield plates to ZL strain relief plates. The shield plate contacts the cable shield with the earth potential.

The result is a secure low resistance connection between cable shield and earth.

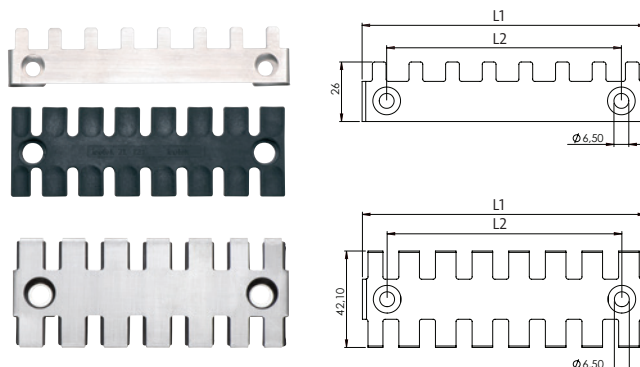
ZL strain relief plates offered separately.

Specifications

Material
Shield plate Stainless steel

Compatible with

- SF|ZL Strain relief plates 149
- ZL Strain relief plates 145
- ZL-AB Strain relief plates 146



MB

Earthing tapes



Product description

Manufactured with highly flexible E-Cu stranded wires with connecting end pads made of tinned copper strips.

4.1 The minimum transition and connecting resistance makes them perfectly suitable for use as earthing tapes.

Earthing Tapes are available with M4, M5, M6, M8 or M10 connections and in some sizes with both connection sizes combined.

Type	Order No.	Length L [mm]	Cross-section mm ²	Hole size	PU
Cross-section 6 mm²					
NEW MB 100 6 M4	32695	100	6	M4	1
MB 100 6 M6	32700	100	6	M6	1
NEW MB 150 6 M4	39710	150	6	M4	1
MB 150 6 M6	32701	150	6	M6	1
MB 200 6 M4	32707	200	6	M4	1
MB 200 6 M6	32702	200	6	M6	1
MB 250 6 M6	32706	250	6	M6	1
MB 300 6 M6	32703	300	6	M6	1
MB 400 6 M6	32704	400	6	M6	1
MB 500 6 M6	32705	500	6	M6	1
Cross-section 10 mm²					
MB 100 10 M6	32730	100	10	M6	1
NEW MB 100 10 M6 + M4	39711	100	10	M6 + M4	1
MB 100 10 M8	32731	100	10	M8	1
MB 150 10 M5	32709	150	10	M5	1
MB 150 10 M5 + M6	32746	150	10	M5 + M6	1
MB 150 10 M8	32732	150	10	M8	1
MB 200 10 M5	32744	200	10	M5	1
MB 200 10 M6	32733	200	10	M6	1
MB 200 10 M6 + M8	32741	200	10	M6 + M8	1
MB 200 10 M8	32734	200	10	M8	1
MB 250 10 M6 + M8	32742	250	10	M6 + M8	1
MB 300 10 M6	32735	300	10	M6	1
MB 300 10 M6 + M8	32743	300	10	M6 + M8	1
MB 300 10 M8	32736	300	10	M8	1
NEW MB 400 10 M4	32878	400	10	M4	1
MB 400 10 M6	32737	400	10	M6	1
MB 400 10 M8	32738	400	10	M8	1
MB 500 10 M6	32739	500	10	M6	1



RoHS compliant



MB

Earthing tapes



Connecting end pads (copper)

Type	Order No.	Length L [mm]	Cross-section mm ²	Hole size	PU
Cross-section 16 mm²					
MB 100 16 M6	32760	100	16	M6	1
MB 100 16 M6 + M8	32758	100	16	M6 + M8	1
MB 100 16 M8	32761	100	16	M8	1
MB 100 16 M10	32759	100	16	M10	1
MB 150 16 M6	32762	150	16	M6	1
MB 150 16 M8	32763	150	16	M8	1
MB 200 16 M6	32764	200	16	M6	1
MB 200 16 M5 + M6	32776	200	16	M5 + M6	1
MB 200 16 M6 + M8	32773	200	16	M6 + M8	1
MB 200 16 M8	32765	200	16	M8	1
MB 250 16 M8	32766	250	16	M8	1
MB 250 16 M6 + M8	32774	250	16	M6 + M8	1
MB 300 16 M6	32767	300	16	M6	1
MB 300 16 M6 + M8	32775	300	16 <td M6 + M8	1	
MB 300 16 M8	32768	300	16	M8	1
MB 350 16 M8	32769	350	16	M8	1
MB 350 16 M5 + M6	32777	350	16	M5 + M6	1
MB 400 16 M6	32873	400	16	M6	1
MB 400 16 M8	32770	400	16	M8	1
MB 500 16 M8	32771	500	16	M8	1
MB 600 16 M8	32772	600	16	M8	1
MB 1000 16 M8	32778	1000	16	M8	1
Cross-section 25 mm²					
MB 100 25 M10	32800	100	25	M10	1
MB 150 25 M10	32801	150	25	M10	1
MB 200 25 M8	32802	200	25	M8	1
MB 200 25 M10	32803	200	25	M10	1
MB 250 25 M8	32804	250	25	M8	1
MB 250 25 M10	32805	250	25	M10	1

Advantages & benefits

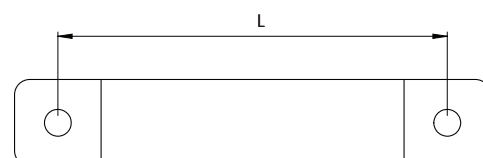
- Available in a variety of lengths and cross-sections
- Low impedances
- UL 467 listed

Specifications

Material Cu-ETP with connecting end pads
Pads made of tinned copper strips

Current Load

Cross-section:	Current load:
6 mm ²	67 – 80 A
10 mm ²	89 – 106 A
16 mm ²	132 – 157 A
25 mm ²	177 – 210 A
35 mm ²	230 – 275 A
50 mm ²	280 – 350 A
70 mm ²	338 – 403 A



MB

Earthing tapes

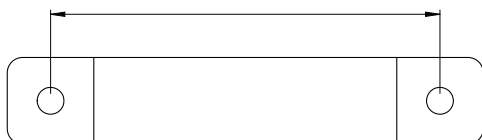


Product description

Manufactured with highly flexible E-Cu stranded wires with connecting end pads made of tinned copper strips.

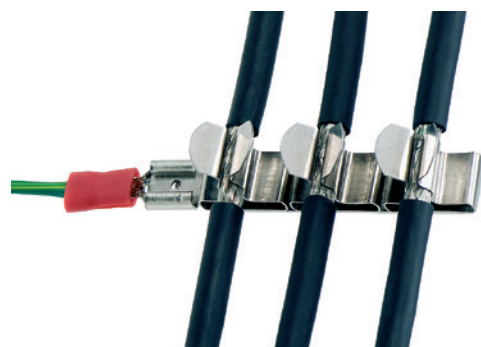
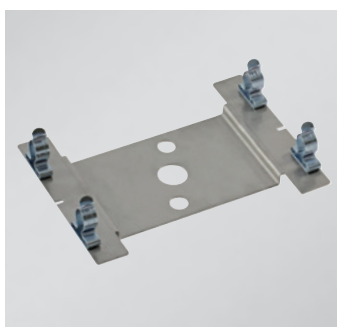
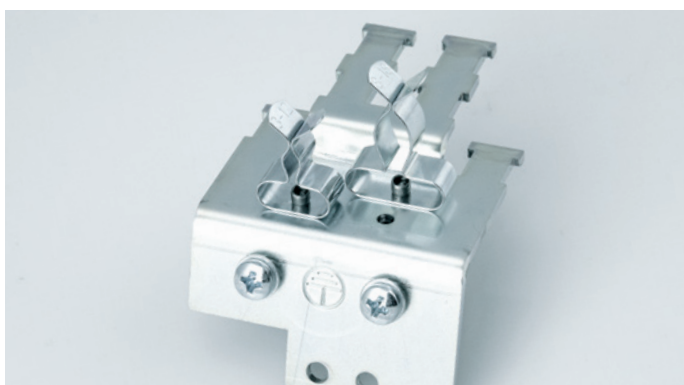
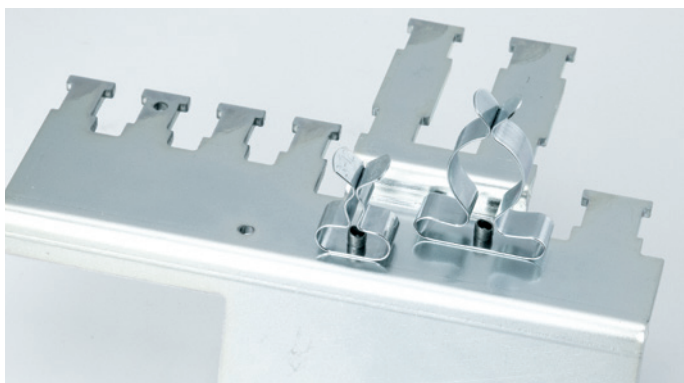
4.1 The minimum transition and connecting resistance makes them perfectly suitable for use as earthing tapes.

Earthing Tapes are available with M4, M5, M6, M8 or M10 connections and in some sizes with both connection sizes combined.



Type	Order No.	Length L [mm]	Cross-section mm ²	Hole size	PU
Cross-section 25 mm²					
MB 300 25 M8	32806	300	25	M8	1
MB 300 25 M10	32807	300	25	M10	1
MB 350 25 M10	32808	350	25	M10	1
MB 400 25 M8	32809	400	25	M8	1
MB 500 25 M8	32810	500	25	M8	1
MB 500 25 M10	32812	500	25	M10	1
MB 600 25 M8	32811	600	25	M8	1
MB 800 25 M8	32815	800	25	M8	1
Cross-section 35 mm²					
MB 200 35 M10	32823	200	35	M10	1
MB 250 35 M10	32824	250	35	M10	1
MB 300 35 M10	32825	300	35	M10	1
Cross-section 50 mm²					
MB 150 50 M10	32847	150	50	M10	1
MB 200 50 M10	32848	200	50	M10	1
MB 250 50 M10	32849	250	50	M10	1
MB 300 50 M10	32850	300	50	M10	1
Cross-section 70 mm²					
MB 200 70 M10*	32868	200	70	M10	1
MB 300 70 M10*	32870	300	70	M10	1
MB 500 70 M10*	32872	500	70	M10	1

EMC Customised solutions



Product description

In addition to our standard product offering we offer customised solutions for your application – even for small quantities!


A wide range of standard clamp assemblies are already available (see pages 182 - 185).

If a standard EMC clamp assembly is not practicable in your case, a custom designed carrier for shield clamps can be supplied.

We look forward to sharing our ideas and custom EMC solutions with you.

Advantages & benefits

- Supply of custom designed carriers for SKL shield clamps
- Cost-effective even for small quantities
- Available for a wide range of cable diameters

 Contact us: pm@icotek.com

4.2 EMC cable entry systems

Solutions for conducted and field-bound disturbances



The industrial process technology demands increasing security against disturbances for electrical MCR facilities (measure, control, regulate). Special emphasis is being placed on the derivation of electromagnetic interference. A distinction is made between screening-related and field-related disturbances.

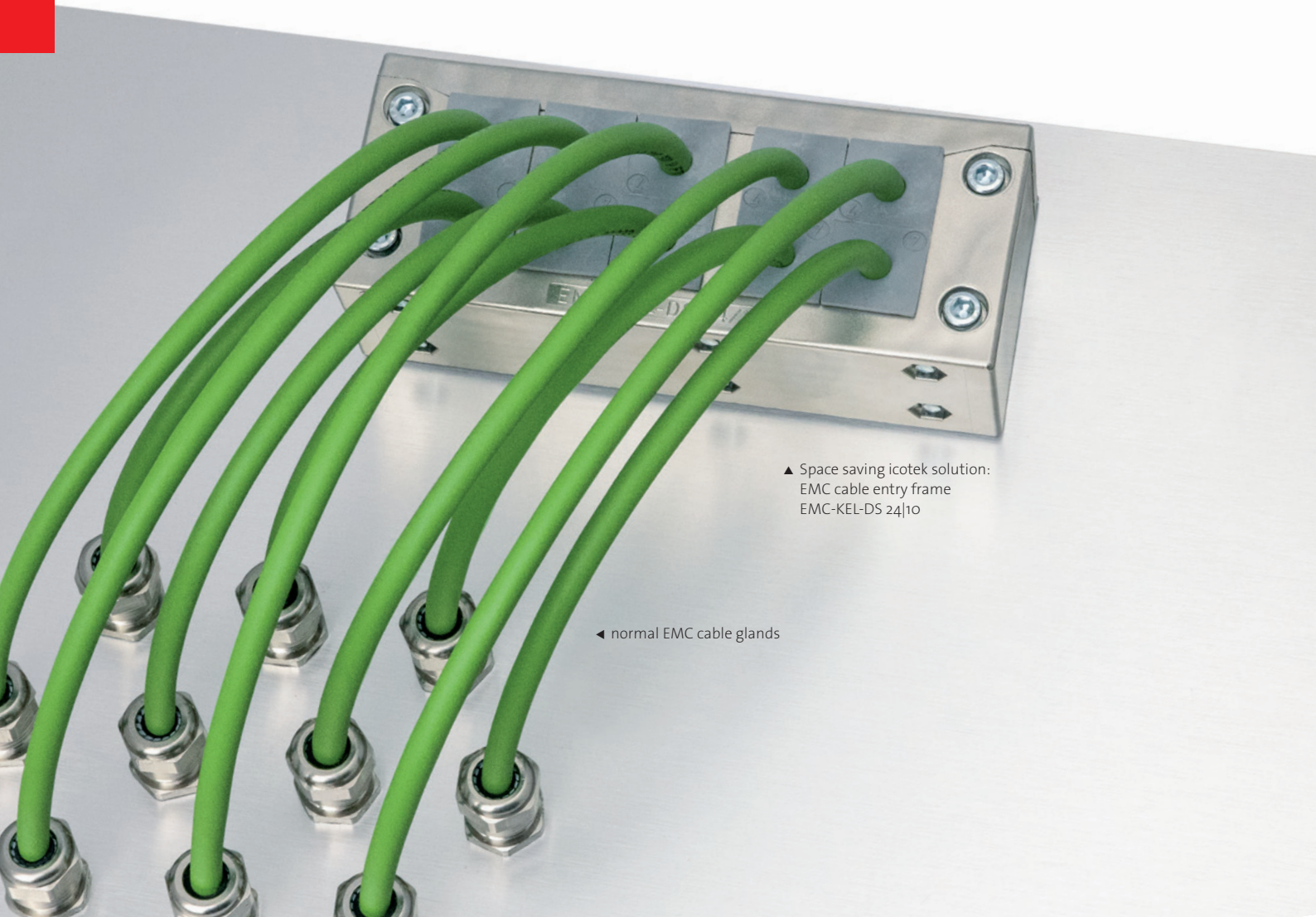
Screening-related interference is being transmitted directly from the source of interference to the cable shield of the supply or signal leads and then to the susceptible device. All capacitive and inductive influences of electrical or magnetic fields are called **field bound disturbances**. The field bound disturbances are being transferred, for example as a cable's electromagnetic field, from the source of interference to the susceptible device and received there, for instance, by a head acting as an antenna.

A large contact area of the cable shield for the derivation of the interference to a conductive housing wall combined with the shielding of the housing interior generally offers a good solution for both types of interference.

In case of conducted as well as field bound EMC disturbances, our cable entry system offers an effective way to divert and block those disturbances.

The key feature of icotek's system is the split frame and split grommets which provide quick, convenient and cost effective routing of pre-terminated and multi-conductor cables, hoses and conduits. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.

4.2



▲ Space saving icotek solution:
EMC cable entry frame
EMC-KEL-DS 24|10

◀ normal EMC cable glands

Chapter content



EMC Cable entry frames
EMC-KEL-DS
198 – 199



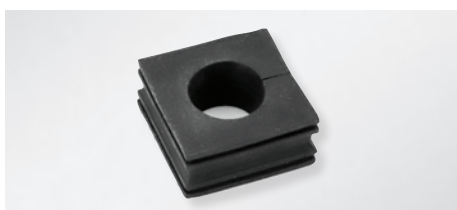
EMC Split cable gland
EMC-KVT-DS
200 – 201



EMC Cable entry frames
EMC-KEL
202 – 203



EMC grommets, small
EMC-KT
204



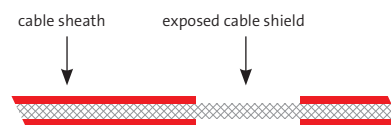
EMC grommets, large
EMC-KT
205

4.2

Test results: Conducted and field-bound disturbances

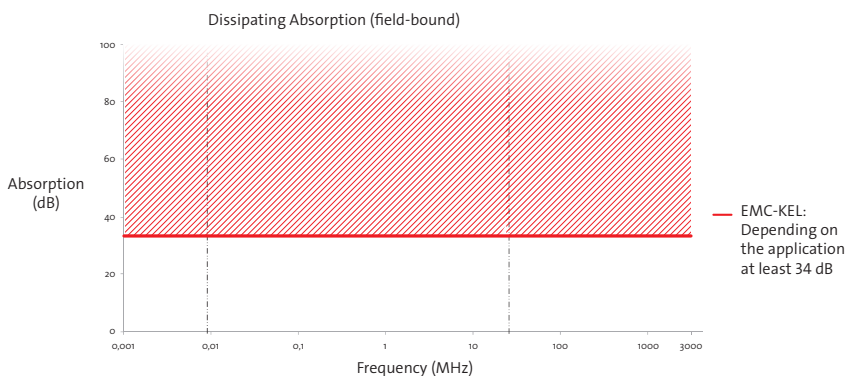
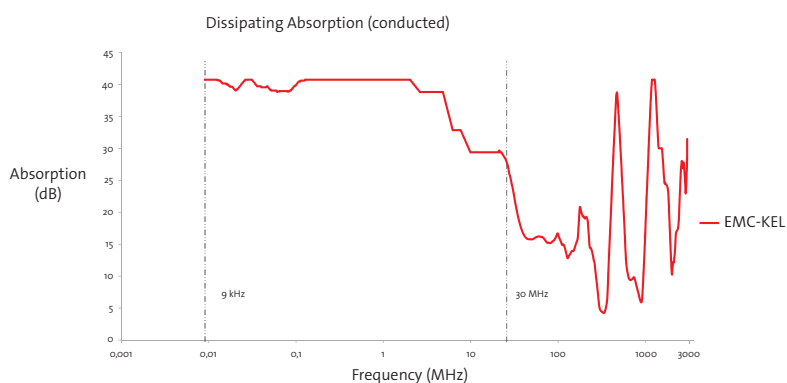
Conducted disturbances

The EMC-KEL shows during cable-bound disruptions stable attenuation values up to 40 dB in the frequency ranges from 9 kHz to 30 MHz.



Field-bound disturbances

Regarding the field-bound disturbances and depending on the application, in the relevant frequency ranges up to 3 GHz constant measurements of at least 34 dB have been achieved. Below the attenuation range, the curve falls only at extreme high frequencies above 3 GHz.



EMC-KEL-DS

EMC Cable entry frames

Product description

The EMC cable entry frame EMC-KEL-DS has been metallised (galvanise coated) to create a conductive surface.

The front cable grommet (A) is used for strain relief and cable sealing on the cable jacket. The cable shield is contacted over 360° via the rear conductive grommet (B).

The contact between the EMC-KEL-DS and the conductive housing wall is realized via the included conductive flat gasket.

Advantages & benefits

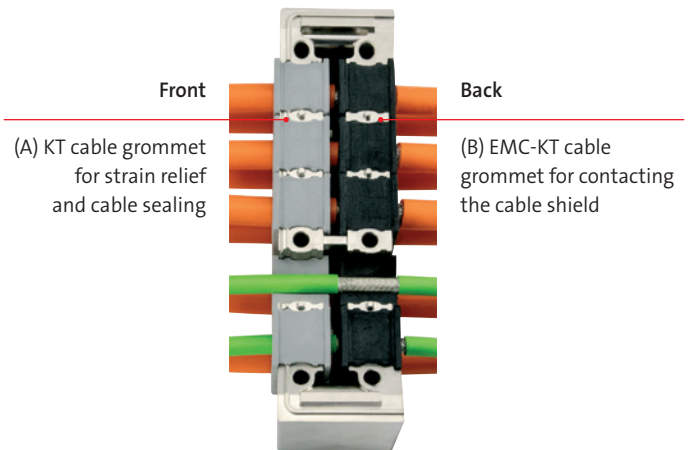
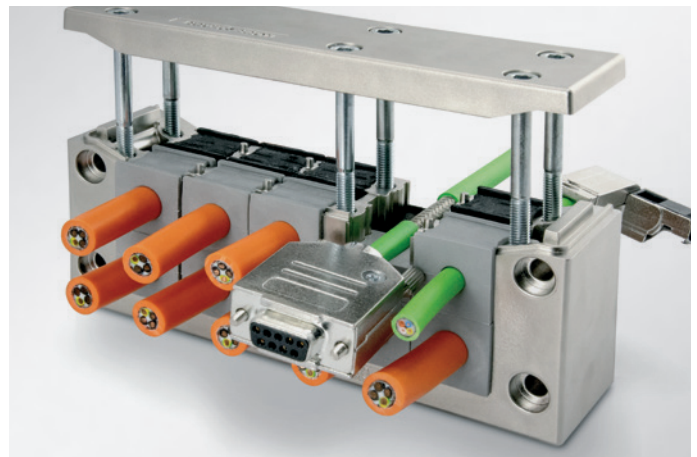
- Perfect for already pre-terminated cables. The connector does not have to be removed for wiring
- Strain relief and sealing are separated from the EMC contact
- Both conducted and field-bound disturbances are reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- EMC grommets made entirely from conductive elastomer
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness
- Integrated strain relief
- Protection class IP55

Specifications

Material	Polyamide, highly conductive coating
Flame class	acc. to UL 94 HB
Temperature	-40°C to + 140°C
Properties	Halogen free, silicone free
Frame depth	40 mm
IP rating	IP55

Accessories

EMC-KT grommets	204 - 205
KT grommets	50 - 52



EMC-KEL-DS

EMC Cable entry frames



IP55

Description	Cut-out Drilling template	Type	Order No.	Cut-out mm	KT Grommets small large	EMC grommets small large	PU
		EMC-KEL-DS 24 10	99410	112 × 36 mm	10 -	10 -	1
		EMC-KEL-DS 24 7	99411	112 × 36 mm	6 1	6 1	1
		EMC-KEL-DS 24 4	99412	112 × 36 mm	2 2	2 2	1
		EMC gasket size 24 conductive gasket for EMC-KEL-DS	98047	112 × 36 mm	-	-	1

4.2



EMC-KVT-DS

EMC Split cable gland

Product description

The split cable gland EMC-KVT-DS is based on the standard icotek KVT product. However, the EMC-KVT-DS has been metallised (galvanise coated) to create a conductive surface.

The first cable grommet (KT small) is used for strain relief and cable sealing on the cable jacket. The second grommet (EMC-KT small) contacts the cable shield at a full 360 degrees.

The conductive flat gasket included in the scope of delivery makes contact between the cable gland and the conductive housing wall. The EMC-KVT-DS can thus be fixed using a plastic lock nut. Alternatively, an additional contact to the metal wall can be made using a special EMC lock nut.

Advantages & benefits

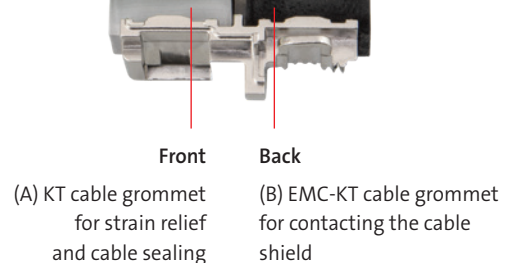
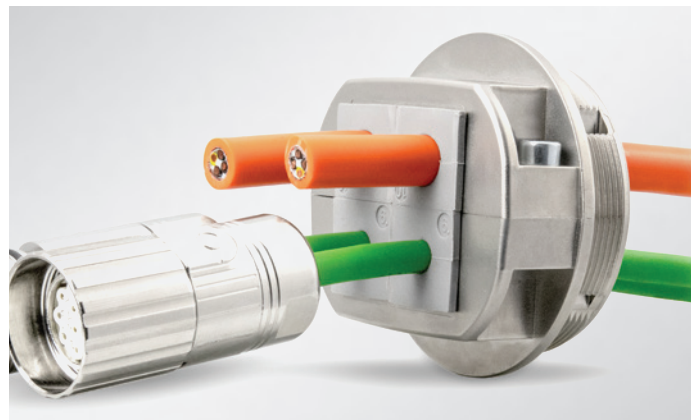
- Perfect for already pre-terminated cables. The connector does not have to be removed for wiring
- Strain relief and sealing are separated from the EMC contact
- Both conducted and field-bound disturbances are reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- EMC grommets made entirely from conductive elastomer
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness
- Integrated strain relief
- Protection class IP55

Specifications

Material	Plastic, highly conductive coating
EMC locknut	Nickel-plated brass
Flame class	acc. to UL 94 HB
Temperature	-40°C to +90°C
Properties	Halogen free, silicone free
IP rating	IP55

Accessories

KT grommets	50 - 52
EMC-KT grommets	204 - 205
KGM	250



EMC locknut

EMC-KVT-DS

EMC Split cable gland



Description	Type	Order No.	KT Grommets small large	EMC grommets small large	Thread Thread length	PU
	EMC-KVT-DS 32 with plastic lock nut KGM 32	99431	1 -	1 -	M32 x 1.5 Length 14 mm	5
	EMC-KVT-DS 32 with EMC lock nut EMC-GM 32 Nickel-plated brass	99432	1 -	1 -	M32 x 1.5 Length 14 mm	5
	EMC-KVT-DS 63 1 with plastic lock nut KGM 63	99434	- 1	- 1	M63 x 1.5 Length 14 mm	1
	EMC-KVT-DS 63 1 with EMC lock nut EMC-GM 63 Nickel-plated brass	99435	- 1	- 1	M63 x 1.5 Length 14 mm	1
	EMC-KVT-DS 63 4 with plastic lock nut KGM 63	99436	4 -	4 -	M63 x 1.5 Length 14 mm	1
	EMC-KVT-DS 63 4 with EMC lock nut EMC-GM 63 Nickel-plated brass	99437	4 -	4 -	M63 x 1.5 Length 14 mm	1
	EMC-GM 32 EMC lock nut M32 for EMC-KVT-DS 32 Nickel-plated brass	99557	-	-	-	5
	EMC-GM 63 EMC lock nut M63 for EMC-KVT-DS 63 Nickel-plated brass	99558	-	-	-	1
	EMC gasket 32 conductive gasket for EMC-KVT-DS 32	99555	-	-	-	1
	EMC gasket 63 conductive gasket for EMC-KVT-DS 63	99556	-	-	-	1

EMC-KEL

EMC Cable entry frames

Product description

The EMC cable entry frames EMC-KEL are based on the KEL-U and KEL-E. Due to a conductive surface, disturbances in the cable shields on the control cabinet can be easily dissipated. Field bound disturbances are derived by the metallisation.

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The EMC-KEL-U frames match exactly the cut-out dimensions for 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed.

The single-row versions EMC-KEL-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

Between the EMC-KEL and the metal wall a conductive flat gasket (included) is mounted. The flange surface on the metal wall must be free of paint.



4.2

Advantages & benefits

- Both conducted and field-bound disturbances can be reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- Grommets made entirely from conductive elastomer
- High cable density
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness

Specifications

Material	Polyamide, highly conductive coating
Flame class	UL 94 HB
Temperature	-40°C to + 140°C
Properties	Halogen free, silicone free
Frame depth	17 mm

Accessories

EMC-KT grommets 204 - 205

EMC-KEL

EMC Cable entry frames



Description	Cut-out	Type	Order No.	Cut-out	Grommets EMC-KT small large	PU
		EMC-KEL-U 24 10	99400	36 × 112 mm	10 -	1
		EMC-KEL-U 24 4	99401	36 × 112 mm	2 2	1
		EMC-KEL-U 16 8	99402	36 × 86 mm	8 -	1
		EMC-KEL-E3	99420	24 × 65 mm	3 -	1
		EMC-KEL-E5	99422	24 × 112 mm	5 -	1
		EMC gasket size 24, conductive gasket for EMC-KEL-U 24 10, EMC-KEL-U 24 4	99550	36 × 112 mm	-	1

EMC-KT

EMC grommets



Product description

The cable grommets type EMC-KT are made of a very conductive elastomer. Thus, faults are dissipated from the cable shield directly via the grommet, a frame and the flat gasket. This ensures full-area protection against field-bound interference!

Assembly

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.





Specifications

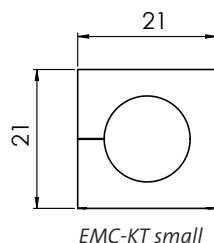
Material	Elastomer, conductive
Flame class	in accordance with UL94-HB
Colour	black
Temperature	-30°C to +80°C
Properties	Halogen free, silicone free

Accessories

ST Plugs 55

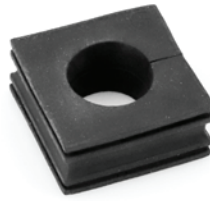
KT grommets can be found on pages 50 – 52.

Description	Type	Order No.	Clamping range	PU
	EMC-BTK	99473	blank grommet	5
	NEW EMC-KT 2	99459	2 – 3 mm	5
	EMC-KT 3	99460	3 – 4 mm	5
	EMC-KT 4	99461	4 – 5 mm	5
	EMC-KT 5	99462	5 – 6 mm	5
	EMC-KT 6	99463	6 – 7 mm	5
	EMC-KT 7	99464	7 – 8 mm	5
	EMC-KT 8	99465	8 – 9 mm	5
	EMC-KT 9	99466	9 – 10 mm	5
	EMC-KT 10	99467	10 – 11 mm	5
	EMC-KT 11	99468	11 – 12 mm	5
	EMC-KT 12	99469	12 – 13 mm	5
	EMC-KT 13	99470	13 – 14 mm	5
	EMC-KT 14	99471	14 – 15 mm	5
	EMC-KT 15	99472	15 – 16 mm	5



EMC-KT

EMC grommets



Description	Type	Order No.	Clamping range	PU
	EMC-BTG	99495	blank grommet	5
	NEW EMC-KTG 13	99496	13 – 14 mm	5
	NEW EMC-KTG 14	99497	14 – 15 mm	5
	NEW EMC-KTG 15	99498	15 – 16 mm	5
	EMC-KT 16	99475	16 - 17 mm	5
	EMC-KT 17	99476	17 - 18 mm	5
	EMC-KT 18	99477	18 - 19 mm	5
	EMC-KT 19	99478	19 - 20 mm	5
	EMC-KT 20	99479	20 - 21 mm	5
	EMC-KT 21	99480	21 - 22 mm	5
	EMC-KT 22	99481	22 - 23 mm	5
	EMC-KT 23	99482	23 - 24 mm	5
EMC-KT 24	99483	24 - 25 mm	5	
EMC-KT 25	99484	25 - 26 mm	5	
EMC-KT 26	99485	26 - 27 mm	5	
EMC-KT 27	99486	27 - 28 mm	5	
EMC-KT 28	99487	28 - 29 mm	5	
EMC-KT 29	99488	29 - 30 mm	5	
EMC-KT 30	99489	30 - 31 mm	5	
EMC-KT 31	99490	31 - 32 mm	5	
EMC-KT 32	99491	32 - 33 mm	5	

Product description

The cable grommets type EMC-KT are made of a very conductive elastomer. Thus, faults are dissipated from the cable shield directly via the grommet, the frame and the flat gasket. This ensures full-area protection against field-bound interference!

Assembly

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.

Specifications

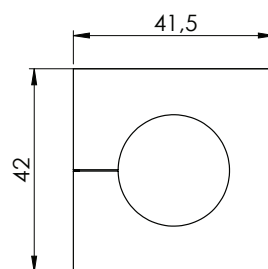
Material	Elastomer, conductive
Flame class	in accordance with UL94-HB
Colour	black
Temperature	-30°C to +80°C
Properties	Halogen free, silicone free

4.2

Accessories

ST Plugs 55

KT grommets can be found on pages 50 – 52.



EMC-KT large

Assembly possibilities

	Var. 1	Var. 2	Var. 3	Var. 4	Var. 5
Outside	EMC-KEL	EMC-KEL	EMC-KEL	KEL-ER (U)	EMC-KEL
Inside	–	–	KEL-EMC-PFM	EMC-KEL	–
EMC: conducted	–	✓	✓	✓	**
EMC: field-bound	✓	✓	✓	✓	–
IP rating	IP54	not defined	IP54	IP66 (IP54)	not defined
Strain relief	✓	–	✓	✓	*

* Standard KT grommets only

** EMC-KT grommets only

Field-bound disturbances with strain relief

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.
The cable shield is not exposed.

1 Outside



Not exposed cable shield



Profile



4.2

Conducted and field-bound disturbances

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing. The cable shield is exposed in the area of the cable grommets.

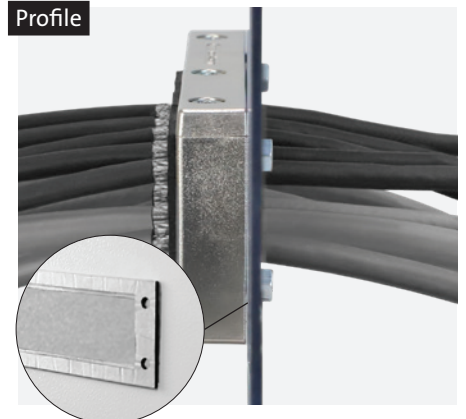
2 Outside



EMC KT grommet

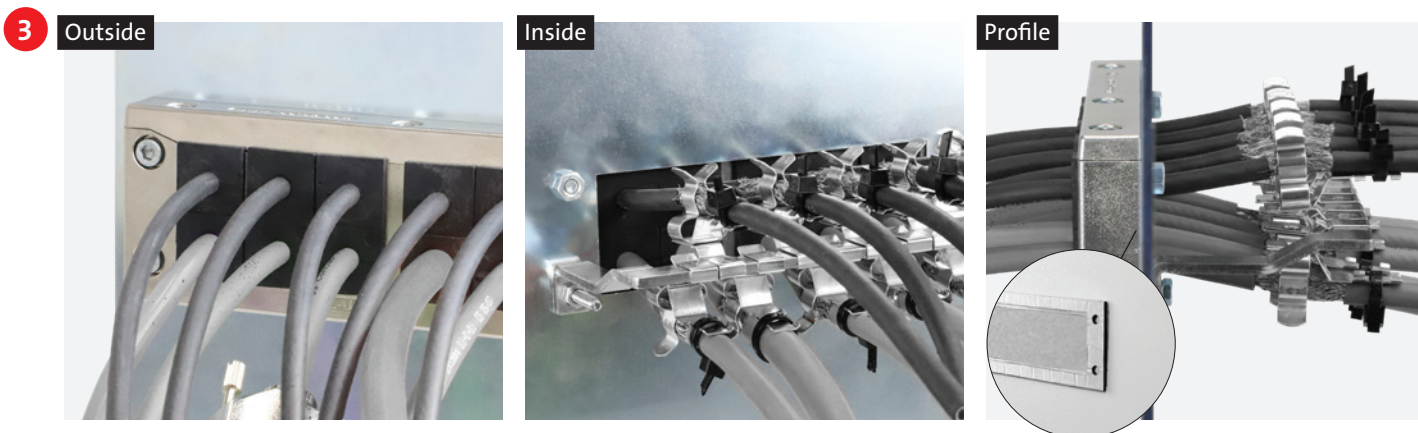


Profile



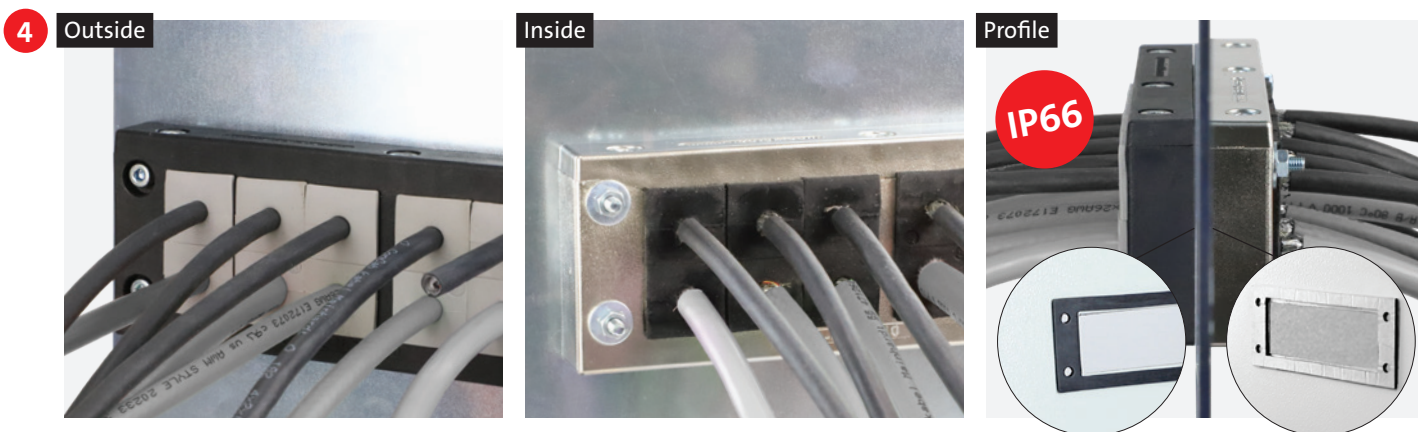
Conducted and field-bound disturbances with strain relief

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.
 Inside the housing, the EMC bracket KEL-EMC-PFM is mounted and the exposed cable shield is placed.



Conducted and field-bound disturbances with strain relief and IP66

A cable entry frame (e.g., KEL-ER or KEL-U) is bolted to the outside of the housing. Inside the housing, the EMC cable entry frame (EMC-KEL) is mounted and the cable shield is exposed in the area of the cable grommets.



4.2

Conducted disturbances with single strain relief

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.
 The cable shield is exposed in the area of the cable grommets. It's possible to use different grommets (KT & EMC-KT).



5 CONFIX™ Cable conduit system

The 90° angled conduit fitting CONFIX FWS is perfect for installation of parallel corrugated cable protection conduits, e.g. in machines, control panels or control cabinets. The liftable cover is tightly fixed by a hinge to the mounting box. Therefore, the system is very easy to handle.

Corrugated conduits CONFIX WS for cable routing are used where cables have to be protected from mechanical damage or certain weather conditions.

In addition, icotek offers split corrugated conduits CONFIX WST for routing pre-terminated cables and corresponding conduit clips CONFIX SH.

Advantages & benefits

1. Fast and easy assembly

The liftable cover of the bulkhead fitting CONFIX FWS is tightly fixed by a hinge to the mounting box. The system is therefore very easy to mount.

2. Easy to maintain

The split version of the corrugated conduits CONFIX WST offers the possibility of routing standard or pre-terminated cables in harsh environments.

3. Flexible

The corrugated conduits CONFIX WS can be used for various applications, depending on the material. UV resistant polyamide conduits for high mechanical requirements (indoor and outdoor use), polypropylene conduits with high resistance against acids/alkalis.



5

CONFIX™ FWS Assembly

Installation of CONFIX FWS is quick and easy:

1. Use top screw(s) to mount the FWS
2. Insert conduit
3. Secure and complete installation with two side screws



Chapter content



Bulkhead fittings, split | IP54
for conduit screw connections/
direct conduit pickup

CONFIX FWS

210 – 211



Corrugated conduits
NW 7,5 – NW 50

CONFIX WS

212 – 213



Corrugated conduits, split
for cables with connectors
NW 10 – NW 70

CONFIX WST

214



Conduit clips
for split corrugated conduits CONFIX WST

CONFIX SH

215

CONFIX™ FWS-A

Bulkhead fittings for conduit screw connections



Product description

The 90° angled conduit fitting CONFIX FWS is for installation of parallel corrugated cable protection conduits, e.g. in machines, control panels or control cabinets.

The liftable cover is tightly fixed by a hinge. Therefore the system is fast and easy to install.

CONFIX FWS is offered in the following versions:

CONFIX FWS-A with metric internal thread M16 to M50

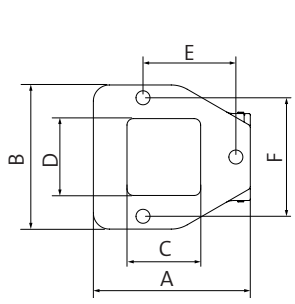
CONFIX FWS-B with a grooved conduit clip for types with sizes NW 13, 17, 23, 29, 37 and 50.

The available colours are grey (RAL 7011) and black (RAL 9005).

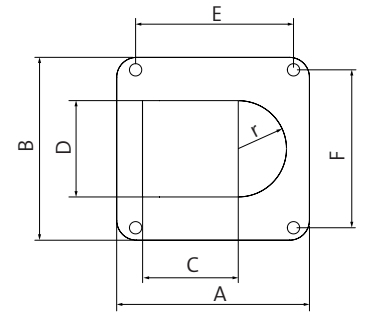
Accessories

CONFIX WS conduits

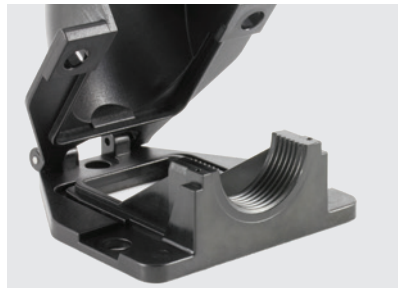
Type	Internal Thread	Hole Ø [mm]	Size (A × B) [mm]	Cut-out (C × D) [mm]	Drill. Templ. (E × F) [mm]	Order No.	PU
CONFIX FWS-A 16	M16 × 1.5	3 × 4.3	49 × 45	22 × 22.6	29 × 37	31381 (grey) 31380 (black)	10
CONFIX FWS-A 20	M20 × 1.5	3 × 4.3	49 × 45	22 × 22.6	29 × 37	31384 (grey) 31383 (black)	10
CONFIX FWS-A 25	M25 × 1.5	3 × 6.6	67 × 63	37 × 28	41.5 × 51.5	31387 (grey) 31386 (black)	10
CONFIX FWS-A 32	M32 × 1.5	4 × 6.6	85.5 × 76	41.9 × 40 r = 20	64.5 × 64.5	31390 (grey) 31389 (black)	10
CONFIX FWS-A 40	M40 × 1.5	4 × 6.6	97 × 92	48.3 × 48.4 r = 24.2	79.5 × 79.5	31393 (grey) 31392 (black)	5
CONFIX FWS-A 50	M50 × 1.5	4 × 6.6	111.5 × 100.5	53 × 60.5 r = 30.25	87.5 × 87.5	31396 (grey) 31395 (black)	5



Size/Drilling template FWS-A 16 to 25



Size/Drilling template FWS-A 32 to 50



Metric internal thread for conduit screw connections

CONFiX™ FWS-BBulkhead fittings
for direct conduit pickup

IP54

Advantages & benefits

- Hinged cover
- Fast and easy installation
- Functional design
- Protection class IP54

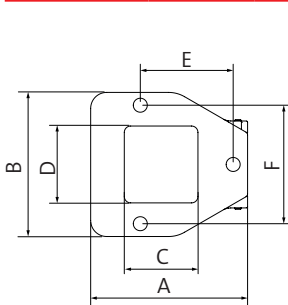
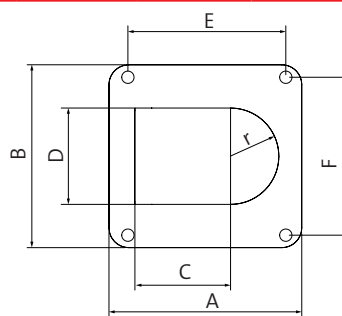
Specifications

Material	Polycarbonate (PC)
Colour	■ grey (RAL 7011) ■ black (RAL 9005)
IP rating	IP54
Flame class	UL94-Vo, self-extinguishing
Temperature	-30°C to +100°C (static)
Properties	Halogen free, silicone free

Accessories

CONFiX WS conduits

Type	Dimension*	Hole Ø [mm]	Size (A × B) [mm]	Cut-out (C × D) [mm]	Drill. Templ. (E × F) [mm]	Order No.	PU
CONFiX FWS-B 11	NW 13	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31411 ■ 31410	10
CONFiX FWS-B 16	NW 17	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31414 ■ 31413	10
CONFiX FWS-B 21	NW 23	3 × 6.6	67 × 63	37 × 28	41.5 × 51.5	■ 31417 ■ 31416	10
CONFiX FWS-B 29	NW 29	4 × 6.6	85.5 × 76	41.9 × 40 r = 20	64.5 × 64.5	■ 31420 ■ 31419	10
CONFiX FWS-B 36	NW 37	4 × 6.6	97 × 92	48.3 × 48.4 r = 24.2	79.5 × 79.5	■ 31423 ■ 31422	5
CONFiX FWS-B 48	NW 50	4 × 6.6	111.5 × 100.5	53 × 60.5 r = 30.25	87.5 × 87.5	■ 31426 ■ 31425	5

Size/Drilling template
FWS-B 11 to 21Size/Drilling template
FWS-B 29 to 48

Grooved conduit clip



Fixed cover due to hinges

* For parallel corrugated cable protection conduit with dimension (NW)

CONFiX™ WS

Corrugated conduits



Product description

Parallel corrugated conduits for cable routing are used where cables have to be protected from mechanical damage or certain weather conditions.

icotek provides conduits in sizes NW 7.5, 8.5, 10, 13, 17, 23, 29, 37, and 50.

Conduits from size NW 13 can be mounted with CONFiX FWS bulkhead fittings.

Parallel corrugated conduits are available in 3 different versions:

- CONFiX WS-PA: Polyamide conduit for high mechanical requirements (e.g. engine compartments, car bodies, construction machines, ship building, rail transportation technology, switch cabinets).

→ Suitable for ground installation

- CONFiX WS-PAL (light): Polyamide conduit for high mechanical requirements

→ Suitable for suspended installation

- CONFiX WS-PP: Polypropylene conduit for use in engine compartments, car bodies and for static installation at machinery and plant engineering.

→ Advantages: Cost-effective, flame class UL94-V2, temperature resistant, resistant to chemicals

Type	External Ø	Internal Ø	Compatible with	Order No.	PU (Length)
CONFiX WS-G-PA-NW 7.5	Ø 10 mm	Ø 6.7 mm	–	■ 31550	50 m
CONFiX WS-B-PA-NW 7.5	Ø 10 mm	Ø 6.7 mm	–	■ 31570	50 m
CONFiX WS-G-PA-NW 8.5	Ø 11.4 mm	Ø 8.4 mm	–	■ 31552	50 m
CONFiX WS-B-PA-NW 8.5	Ø 11.4 mm	Ø 8.4 mm	–	■ 31572	50 m
CONFiX WS-G-PA-NW 10	Ø 13 mm	Ø 9.9 mm	–	■ 31554	50 m
CONFiX WS-B-PA-NW 10	Ø 13 mm	Ø 9.9 mm	–	■ 31574	50 m
CONFiX WS-G-PA-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFiX FWS-B 11	■ 31556	50 m
CONFiX WS-B-PA-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFiX FWS-B 11	■ 31576	50 m
CONFiX WS-G-PA-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFiX FWS-B 16	■ 31558	50 m
CONFiX WS-B-PA-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFiX FWS-B 16	■ 31578	50 m
CONFiX WS-G-PA-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFiX FWS-B 21	■ 31560	50 m
CONFiX WS-B-PA-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFiX FWS-B 21	■ 31580	50 m
CONFiX WS-G-PA-NW 29	Ø 34.5 mm	Ø 29 mm	CONFiX FWS-B 29	■ 31562	25 m
CONFiX WS-B-PA-NW 29	Ø 34.5 mm	Ø 29 mm	CONFiX FWS-B 29	■ 31582	25 m
CONFiX WS-G-PA-NW 37	Ø 42.4 mm	Ø 36 mm	CONFiX FWS-B 36	■ 31564	25 m
CONFiX WS-B-PA-NW 37	Ø 42.4 mm	Ø 36 mm	CONFiX FWS-B 36	■ 31584	25 m
CONFiX WS-G-PA-NW 50	Ø 54.5 mm	Ø 47.7 mm	CONFiX FWS-B 48	■ 31566	25 m
CONFiX WS-B-PA-NW 50	Ø 54.5 mm	Ø 47.7 mm	CONFiX FWS-B 48	■ 31586	25 m



Compatible with CONFiX FWS-B

CONFIX™ WS Corrugated conduits



Type	External Ø	Internal Ø	Compatible with	Order No.	PU (Length)
CONFIX WS-B-PAL-NW 7.5	Ø 10 mm	Ø 6.7 mm	–	■ 31590	50 m
CONFIX WS-B-PAL-NW 8.5	Ø 11.4 mm	Ø 8.4 mm	–	■ 31592	50 m
CONFIX WS-B-PAL-NW 10	Ø 13 mm	Ø 9.9 mm	–	■ 31594	50 m
CONFIX WS-B-PAL-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFIX FWS-B 11	■ 31596	50 m
CONFIX WS-B-PAL-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFIX FWS-B 16	■ 31598	50 m
CONFIX WS-B-PAL-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFIX FWS-B 21	■ 31600	50 m
CONFIX WS-B-PAL-NW 29	Ø 34.5 mm	Ø 29 mm	CONFIX FWS-B 29	■ 31602	25 m
CONFIX WS-B-PAL-NW 37	Ø 42.4 mm	Ø 36 mm	CONFIX FWS-B 36	■ 31604	25 m
CONFIX WS-B-PAL-NW 50	Ø 54.4 mm	Ø 47.7 mm	CONFIX FWS-B 48	■ 31606	25 m
CONFIX WS-B-PP-NW 7.5	Ø 10 mm	Ø 7.1 mm	–	■ 31610	50 m
CONFIX WS-B-PP-NW 8.5	Ø 11.4 mm	Ø 8.4 mm	–	■ 31612	50 m
CONFIX WS-B-PP-NW 10	Ø 13 mm	Ø 9.9 mm	–	■ 31614	50 m
CONFIX WS-B-PP-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFIX FWS-B 11	■ 31616	50 m
CONFIX WS-B-PP-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFIX FWS-B 16	■ 31618	50 m
CONFIX WS-B-PP-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFIX FWS-B 21	■ 31620	50 m
CONFIX WS-B-PP-NW 29	Ø 34.5 mm	Ø 29 mm	CONFIX FWS-B 29	■ 31622	25 m
CONFIX WS-B-PP-NW 37	Ø 42.4 mm	Ø 36 mm	CONFIX FWS-B 36	■ 31624	25 m
CONFIX WS-B-PP-NW 50	Ø 54.5 mm	Ø 47.7 mm	CONFIX FWS-B 48	■ 31626	25 m

Specifications WS-PA

Material	Polyamide (PA)
Colour	■ black ■ grey
Flame class	UL 94-HB
Temperature	-40°C to +120°C
Properties	Halogen free, UV resistant, according to EN ISO 8580

Specifications WS-PAL

Material	Polyamide (PA)
Colour	■ black
Flame class	UL 94-HB
Temperature	-40°C to +120°C
Properties	Halogen free, UV resistant according to EN ISO 8580

Specifications WS-PP

Material	Polypropylene (PP)
Colour	■ black
Flame class	UL 94 V-2, self-extinguishing
Temperature	-40°C to +135°C
Properties	Halogen free, high resistance against acids/alkalis

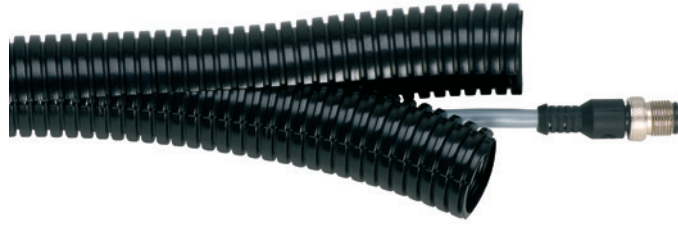
Compatible with

CONFIX FWS Bulkhead fitting

* For parallel corrugated cable protection conduit with dimension (NW)

CONFIX™ WST

Split corrugated conduits



Product description

The CONFiX WST is a two-part corrugated conduit that is perfect for routing cables with or without connectors in harsh environments.

In conjunction with e.g. KVT-W90, a high degree of flexibility is achieved. Numerous conduit sizes can be used thanks to the wide variety of split grommets offered.

The length of the CONFiX WST split corrugated conduit can be customized to your application. All conduits are available by the meter (0.5 m steps).

Advantages & benefits

- Containing pre-terminated cables, warranty of cable remains
- Retrofitting and maintenance carried out easily and quickly

5

Specifications

Material	Polypropylene, black
Flame class	UL 94-V2
Temperature	- 30°C to + 105°C
Properties	UV resistant

Compatible with

CONFIX SH Conduit clip	215
Cable entry systems for pre-terminated cables	8 – 95
Cable entry systems for standard cables	96 – 125

Type	Order No.	Internal diameter	External diameter	Compatible grommets	Compatible with CONFiX FWS-B	Dimensions	Ring length*	Bending radius (static)
CONFIX WST NW 10	31200	8.4 mm	13.4 mm	KT 13	–	NW 10	50 m*	25 mm
CONFIX WST NW 14	31210	12.5 mm	18.5 mm	KT 18	31411 31410	NW 14	50 m*	35 mm
CONFIX WST NW 16	31215	16 mm	21.5 mm	KT 22	31414 31413	NW 16	50 m*	40 mm
CONFIX WST NW 20	31220	19.2 mm	25.30 mm	KT 25	–	NW 20	50 m*	45 mm
CONFIX WST NW 23	31230	23.4 mm	30.8 mm	KT 30	31417 31416	NW 23	50 m*	50 mm
CONFIX WST NW 29	31235	27.3 mm	35.5 mm	KTMB-P	31420 31419	NW 29	25 m*	90 mm
CONFIX WST NW 37	31240	31 mm	41.4 mm	KTMB-P	31423 31422	NW 37	25 m*	110 mm
CONFIX WST NW 45	31250	42.7 mm	54 mm	KTMB-Q	31426 31425	NW 45	25 m*	130 mm
CONFIX WST NW 70	31260	67 mm	79.8 mm	KEL-ULTRA flex	–	NW 70	10 m*	190 mm



Individual lengths are possible!

CONFIX™ SH

Conduit clips for WST



Type	Order No.	Suitable conduit	Fixing hole	Width [mm]	Height [mm]	PU
CONFIX SH 10	31300	WST NW 10	M5	18.5	21	10
CONFIX SH 14	31310	WST NW 14	M5	24	25.5	10
CONFIX SH 16	31315	WST NW 16	M6	30	35	10
CONFIX SH 20	31320	WST NW 20	M6	35	36	10
CONFIX SH 23	31330	WST NW 23	M6	42	43.5	10
CONFIX SH 29	31335	WST NW 29	M6	48	48.5	10
CONFIX SH 37	31340	WST NW 37	M6	55	56.5	10
CONFIX SH 45	31350	WST NW 45	M6	67	68	10
CONFIX SH 70	31360	WST NW 70	M6	100	101	10



Product description

CONFIX SH Conduit clips are a one-piece clamping system to provide secure mounting points for corrugated conduit systems.

The clips are secured to their mounting position through a central mounting point with a hexagonal counter-bore.

Specifications

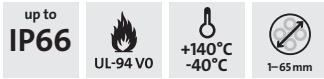
Material	Polyamide (PA), black
Flame class	UL94-V2, self-extinguishing
Temperature	- 40°C to + 120°C
Properties	Halogen free, silicone free

Compatible with

CONFIX WST
Split corrugated conduit

6 Enclosure accessories

Gland plates, flange plates & accessories



Enclosure gland plates

Electronic enclosures which are used in industrial manufacturing processes have to be reliably protected against dirt and dust ingress. The accumulation of dust and dirt can lead to short circuits and overheating of internal components. This can easily lead to machine downtime, premature maintenance requirements and at worst fire or electric shock incidents.

When running cables through the base of an enclosure you are susceptible to dust and debris entering through the cable ingress point. Components with internal fans and air-conditioning can create a suction through any opening, pulling dust and debris into the cabinet. The icotek gland plates KDR-ESR and KDRS-ESR provide the perfect solution to prevent dust build up and keep your cabinet running efficiently.

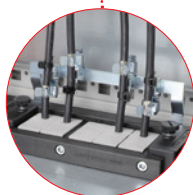
KDR-ESR-VX25



KDRS-ESR-VX25



Routing of pre-terminated cables of up to 65 mm in diameter (KEL-JUMBO)



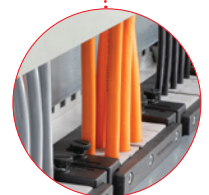
Optional with EMC cable assembly KDR-EMC-PFM



Fast and tool-free mounting of KEL-U cable entry frames



Routing of pre-terminated cables of up to 35 mm in diameter (KEL-U 24)

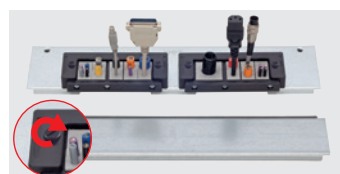


Straight cable routing into the cable duct

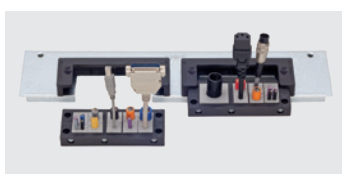
KDR-ESR/KDRS-ESR Assembly



1 The gland plate is fixed in the enclosure floor. The KEL cable entry frames are fitted.



3 Afterwards the KEL frames are pushed into the slide frames and fixed with the knurled screws.



2 The KEL cable entry frames are screwed together after fitting.



4 Finally, the middle gland plate which is part of the standard enclosure, moves together with the KDR-ESR plates.

Chapter content



IP54

Rittal/Hoffman/Häwa
Enclosure gland plates
with slide frames for cable entry frames

KDR-ESR-VX25 / KDR5-ESR-VX25 /
KDR-ESR-TS8 / KDR-ESR-HW / KDR-ESR-HG2

218 – 227



IP54

Rittal
Enclosure gland plates
split, for cable entry frames

KDR 2-VX25 / KDR 2-TS8

228 – 229

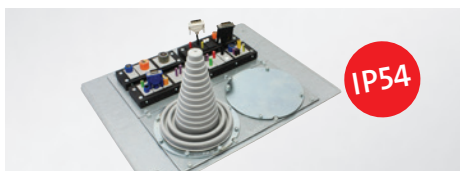


IP54

Rittal/Lohmeier
Module plates
for cable entry components

MP

230 – 231



IP54

Rittal
Enclosure gland plates
for MP module plates

KDR-BMP-VX25 / KDR-BMP-TS8

232 – 235



IP66
IP54

Rittal / Fibox
Flange plates for enclosures
for cable entry components

FP-AX / FP-AE / FP-KX / FP-KL / FP-BG /
FP-FL21

236 – 245



IP65

Blank plates

BPK / BPK-RF / BPM / BPK-SNAP

246 – 248



Supports
for DIN rails and bus bars

MF

249



Hexagonal Locknuts
M16 – M85

KGM / GM / GMT

250



Drainage Device

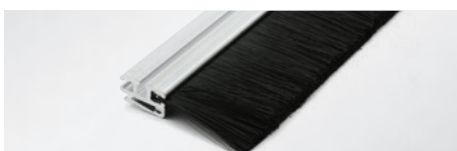
251



Cable clamp
for C-rail mount

CCL

144



Rittal / Hoffman / Others
Universal brush strip
for enclosures

KDR-BES-U

254 – 261



Rittal
Enclosure gland plates
with brush grommets

KDR-BES-TS8

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Rittal
Split flange plates
with brush strips

FP-AX-BES-U

264 – 265

KDR-ESR-VX25

Rittal enclosure gland plate with slide frames



Product description

The KDR-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required are closed with BPK-SNAP blank plates.

Advantages & benefits

- Easy assembly and removal
- Prepared for the assembly of KDR-EMV-PFM
- Ideal for maintenance and retrofitting
- Reserve can be scheduled
- Space-saving solution
- No additional sheet metal work required

Specifications

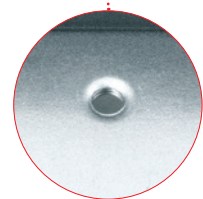
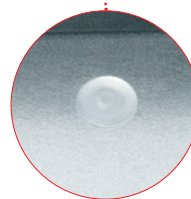
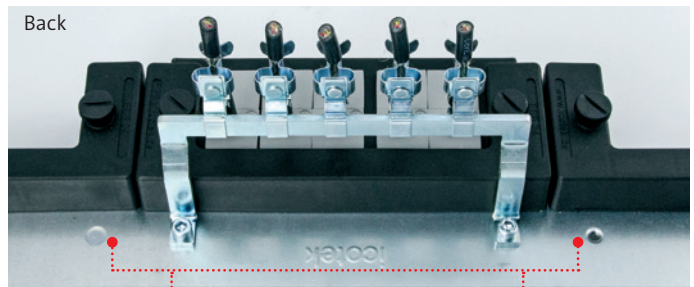
Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	- 40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

KEL-ER 16/24 Cable entry frames	8 - 9
KEL(-U) 16 / 24 Cable entry frames	12 - 14
KEL-QUICK 16 / 24 Cable entry frames	70 - 71
KEL-JUMBO Cable entry frames	38
BPK-SNAP 16 / 24 Blank plates	246



Slide frames which are no longer required are closed with BPK-SNAP blank plates.



Prepared for the assembly of KDR-EMV-PFM. The plates are fitted with threaded screw holes (M5), blocked with plugs. These can be easily removed if necessary. By using the KDR-EMV-PFM, there is no need to additionally install a DIN rail/bus bar above the cable entry, which would otherwise have to be attached in order to implement the EMC connection.

KDR-ESR-VX25

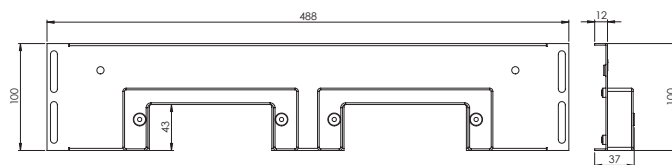
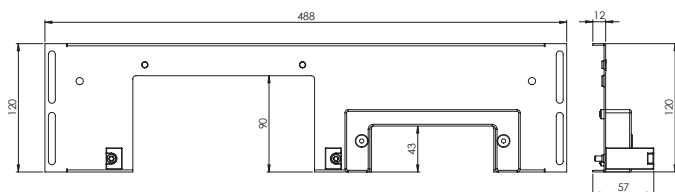
Rittal enclosure gland plate with slide frames



IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	-	-	-	2	44500
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	-	1	-	1	44501
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	1	-	2	-	44502
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	-	-	1	3	44503
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	1	-	1	2	44504
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	-	1	-	2	44505
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	-	-	2	44506
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	1	-	-	1	44507
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	1	1	-	44508
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	-	-	-	3	44509
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	1	-	1	1	44510
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	-	1	-	1	44511

* if both fields of the enclosure are fitted, two complete gland plates are required.



EMC cable assembly for KDR-ESR-VX25

Type	Order No.	Material	PU
KDR-EMC-PFM 16	39192	Steel, zinc plated	1
KDR-EMC-PFM 24	39191	Steel, zinc plated	1



Suitable EMC shield clamps can be found on pages 164, 165 (PFSZ, SKS, SS|SK, SS|SKZ).

KDRS-ESR-VX25

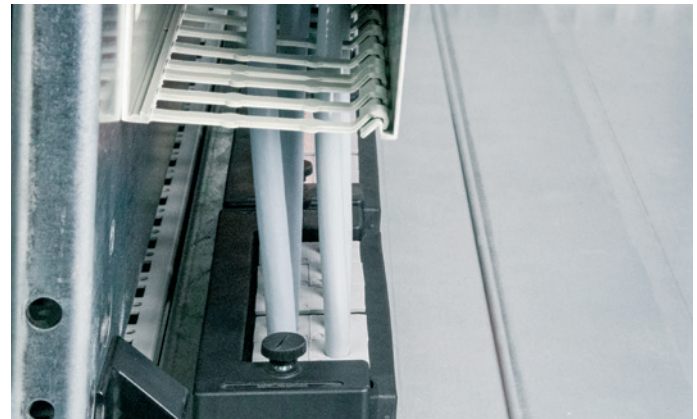
Rittal enclosure gland plate,
narrow, with slide frames



Product description

The KDRS-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDRS-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.



Advantage KDRS: Straight cable routing into the cable duct due to the extremely narrow gland plate

Advantages & benefits

- Easy assembly and removal
- The KDRS-ESR floor plate is very narrow. As a result, the inserted cables are inserted straight into the cable duct.
- Ideal for maintenance and retrofitting
- Reserve can be scheduled
- Space-saving solution
- No additional sheet metal work required



Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	-40°C to +90°C (static)
Properties	Halogen free, silicone free

6

Compatible with

KEL-ER 16/24 Cable entry frames	8 - 9
KEL(-U) 16 / 24 Cable entry frames	12 - 14
KEL-QUICK 16 / 24 Cable entry frames	70 - 71
BPK-SNAP 16 / 24 Blank plates	246



icotek can also produce enclosure gland plates for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!

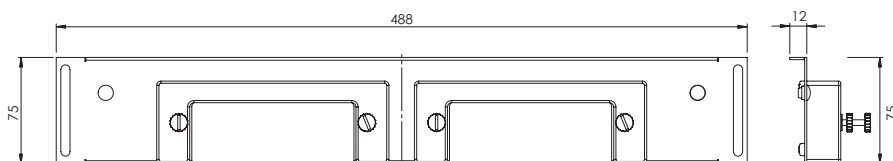
KDRS-ESR-VX25

Rittal enclosure gland plate,
narrow, with slide frames



IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16[...]	KEL(-U) 24[...]	
KDRS-ESR-VX25-600 (narrow) 75 mm	600 mm	488 mm	452 mm	–	–	–	2	44512
KDRS-ESR-VX25-800 (narrow) 75 mm	800 mm	688 mm	652 mm	–	–	–	3	44513
KDRS-ESR-VX25-1000 (narrow) 75 mm	1000 mm*	438 mm	402 mm	–	–	–	2	44514
KDRS-ESR-VX25-1200 (narrow) 75 mm	1200 mm*	538 mm	502 mm	–	–	–	3	44515



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

* if both fields of the enclosure are fitted, two complete gland plates are required.

KDR-ESR-TS8

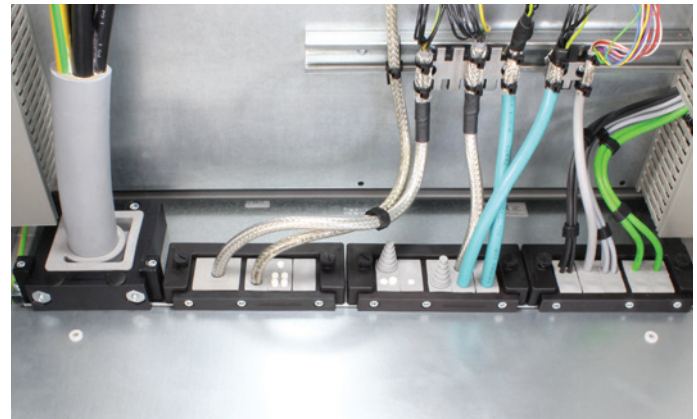
Rittal TS8 enclosure gland plate with slide frames



Product description

The KDR-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required are closed with BPK-SNAP blank plates.



Advantages & benefits

- Easy assembly and removal
- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR-ESR is designed for Rittal enclosures VX25 & TS 8. Other sizes can be supplied on request
- No additional sheet metal work required
- Retrofitting possible without disconnecting cables. Everything can be built around the cables

Specifications

6	Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
	Flame class	UL 94 V-0, self-extinguishing
	IP rating	IP54, with gasket and correct selection of cable entry devices
	Temperature	- 40°C to + 90°C (static)
	Properties	Halogen free, silicone free

Compatible with

KEL(-U) 16 / 24 Cable entry frames	12 - 14
KEL-QUICK 16 / 24 Cable entry frames	70 - 71
KEL-JUMBO Cable entry frames	38
BPK-SNAP 16 / 24 Blank plates	246



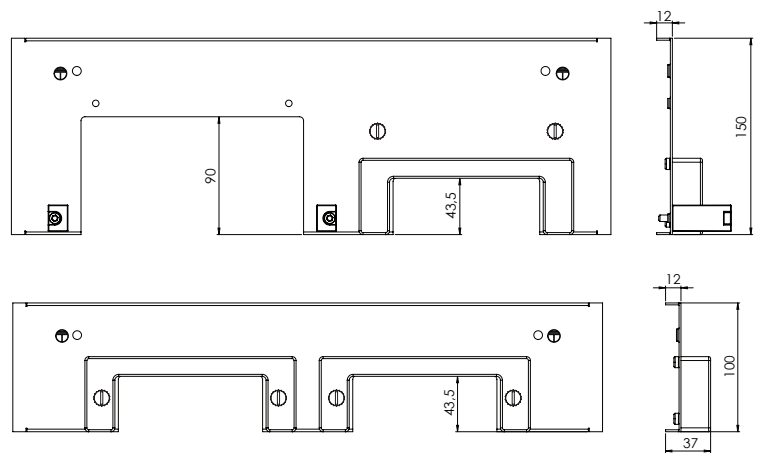
Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR-ESR-TS8

Rittal TS8 enclosure gland plate
with slide frames

IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR for Rittal TS8								
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	-	-	-	2	43079
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	-	1	-	1	43070
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	1	-	2	-	43071
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	-	-	1	3	43080
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	1	-	-	3	43072
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	-	1	-	2	43073
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	-	-	5	43081
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	1	-	-	4	43074
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	1	-	3	43075
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	-	-	2	43082
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	1	-	-	1	43076
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	1	-	1	43077
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	-	-	-	3	43083
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	1	-	-	2	43078
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	-	1	-	1	43084



KDR-ESR-TS8 for Rittal TS 8

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

KDR-ESR-HW

Enclosure gland plate with slide frames for Häwa enclosures



Product description

The KDR-ESR HW is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled. After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. Slide frames which are no longer required are closed with BPK-SNAP blank plates. The gland plate KDR-ESR HW is designed for Häwa enclosures series H395 and series H390.

Advantages

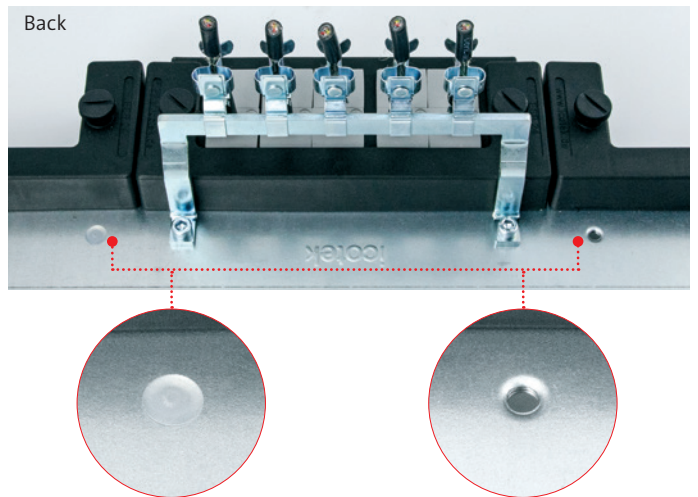
- Easy assembly and removal
- Even large connectors can be installed easily
- Retrofitting possible without disconnecting cables. Everything can be built around the cables
- Prepared for the assembly of KDR-EMV-PFM
- No additional sheet metal work required
- The gland plate KDR-ESR HW is designed for Häwa enclosures series H395 and series H390
- Other sizes are available on request

Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA))
Flame class	UL 94 V-0, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	-40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

KEL-ER 24 Cable entry frames	9
KEL(-U) 24 Cable entry frames	13
KEL-QUICK 24 Cable entry frames	70 - 71
KEL-JUMBO Cable entry frames	141
BPK-SNAP 24 Blank plates	248



Prepared for the assembly of KDR-EMV-PFM. The plates are fitted with threaded screw holes (M5), blocked with plugs. These can be easily removed if necessary. By using the KDR-EMV-PFM, there is no need to additionally install a DIN rail/bus bar above the cable entry, which would otherwise have to be attached in order to implement the EMC connection.



Slide frames which are no longer required are closed with BPK-SNAP blank plates.

KDR-ESR-HW

Enclosure gland plate
with slide frames
for Häwa enclosures

IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR HW for Häwa enclosures series H395 and series H390								
KDR-ESR HW-600 + 1 blank plate	600 mm	427 mm	392 mm	–	–	–	2	44520
KDR-ESR HW-800 + 1 blank plate	800 mm	627 mm	592 mm	–	–	–	3	44521
KDR-ESR HW-800	1000 mm	627 mm	592 mm	1	–	–	2	44522
KDR-ESR HW-1000 + 1 blank plate	1000 mm	827 mm	792 mm	–	–	–	4	44523
KDR-ESR HW-1200 + 1 blank plate	1200 mm	1027 mm	992 mm	–	–	–	5	44524
KDR-ESR HW-1200	1200 mm	1027 mm	992 mm	1	–	–	4	44525
KDR-ESR HW-1200	1200 mm	1027 mm	992 mm	–	1	–	4	44526

6

i icotek can also produce enclosure gland plates for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR-ESR-HG2

Enclosure gland plate with slide frames for Hoffman PROLINE G2

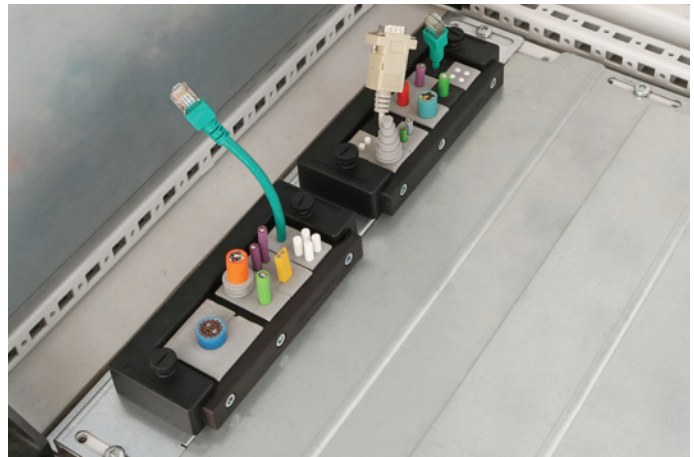
IP54



Product description

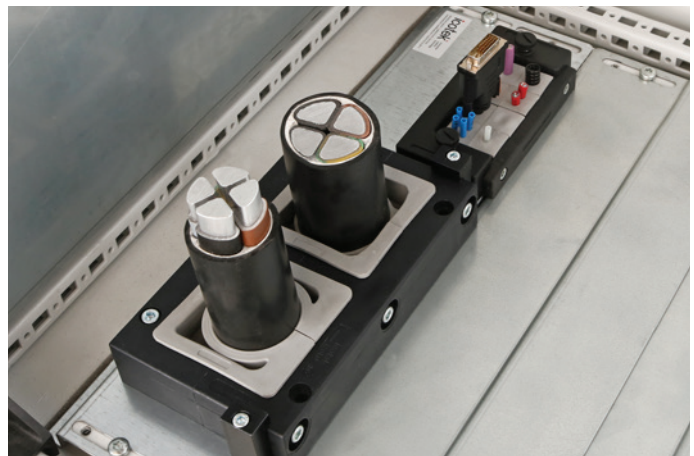
The KDR-ESR-HG2 is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR-HG2 and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.



Advantages & benefits

- Easy assembly and removal
- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR-ESR-HG2 is designed for Hoffman enclosures PROLINE G2. Other sizes can be supplied on request
- No additional sheet metal work required
- Retrofitting possible without disconnecting cables. Everything can be built around the cables



Specifications

6

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL 94 V-o, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	-40°C to +90°C (static)
Properties	Halogen free, silicone free

Compatible with

KEL(-U) 16 / 24 Cable entry frames	12 - 14
KEL-QUICK 16 / 24 Cable entry frames	70 - 71
KEL-JUMBO Cable entry frames	38
BPK-SNAP 16 / 24 Blank plates	246



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

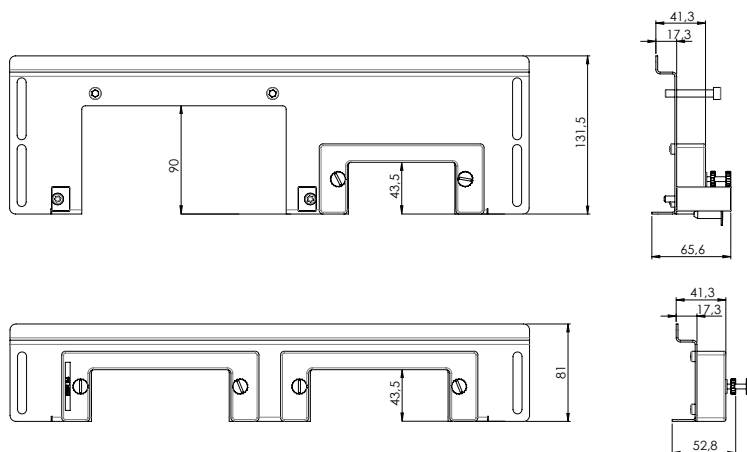
KDR-ESR-HG2

Enclosure gland plate with slide frames
for Hoffman PROLINE G2



IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries			Order No.
				JUMBO 2	KEL(-U) 16[...]	KEL(-U) 24[...]	
KDR-ESR-HG2-600	600 mm / 1200 mm*	432 mm	368 mm	1	1	-	43250
KDR-ESR-HG2-600	600 mm / 1200 mm*	432 mm	368 mm	-	-	2	43251
KDR-ESR-HG2-800	800 mm	632 mm	568 mm	1	-	2	43252
KDR-ESR-HG2-800	800 mm	632 mm	568 mm	-	-	3	43253
KDR-ESR-HG2-1000	1000 mm	832 mm	768 mm	1	-	3	43254
KDR-ESR-HG2-1000	1000 mm	832 mm	768 mm	-	-	4	43255



6

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

KDR 2-VX25 | KDR 2-TS8

Split Rittal enclosure gland plates



Product description

Split, 2-part gland plates KDR 2 with pre-cut holes for KEL and KEL-JUMBO cable entry systems.

Integrated screw holes provide quick and easy installation of KEL frames.

Advantages & benefits

- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR 2 is designed for Rittal enclosures TS 8 & VX25. Other sizes can be supplied on request
- Retrofitting is possible without disconnecting of cables. All can be installed around the cables.
- No additional sheet metal work required
- Cut-outs, which are no longer required, are covered with metal blank plates Type BPM

Specifications

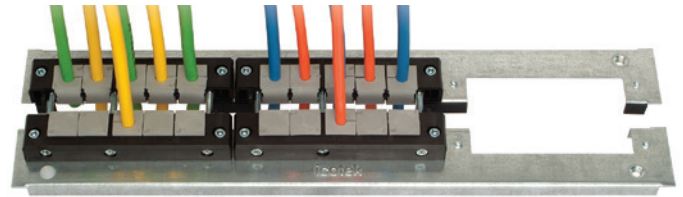
Material **Sheet steel, zinc-plated**

Compatible with

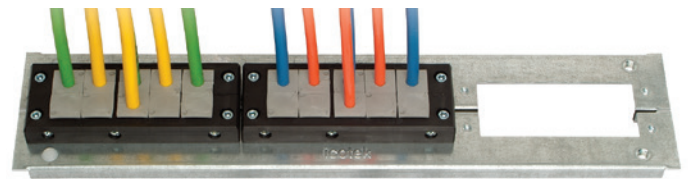
KEL 24 Cable entry frames	17
KEL-JUMBO Cable entry frames	38
BPM Blank plates metal	247



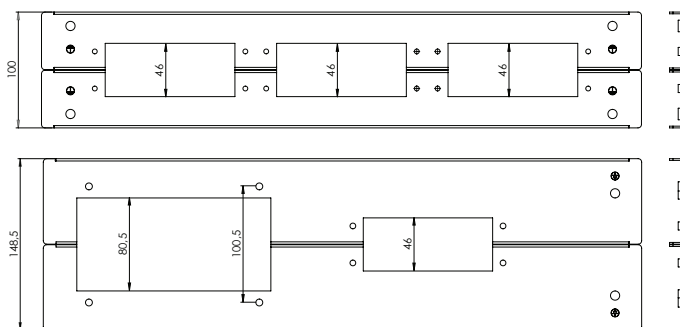
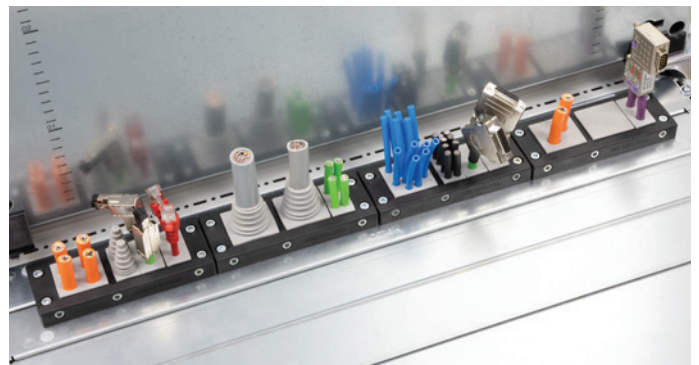
KDR 2 Assembly



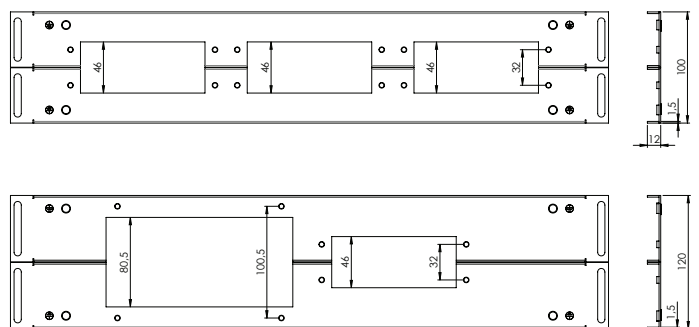
When the cable entry frames are assembled, the KDR gland plates move together for a tight, secure hold of the cable entry systems.



The frame parts with grommets have to be built up before final assembly, i.e. before screwing the system together. Screwing of the cable entry frames tightens both parts of the split gland plate.



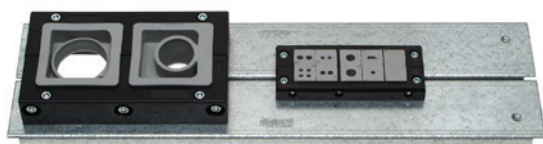
KDR 2-TS8 for Rittal TS 8



KDR 2-VX25 for Rittal VX25

KDR 2-VX25 | KDR 2-TS8

Split Rittal enclosure gland plates



Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries			Order No.
				JUMBO 1	JUMBO 2	KEL 24 ...	
KDR 2 for Rittal VX25							
KDR 2-VX25-600	600 mm	488 mm	452 mm	-	-	3	44400
KDR 2-VX25-600	600 mm	488 mm	452 mm	1	-	2	44401
KDR 2-VX25-600	600 mm	488 mm	452 mm	-	1	1	44402
KDR 2-VX25-800	800 mm	688 mm	652 mm	-	-	4	44403
KDR 2-VX25-800	800 mm	688 mm	652 mm	1	-	3	44404
KDR 2-VX25-800	800 mm	688 mm	652 mm	-	1	2	44405
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	-	2	44406
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	1	-	1	44407
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	1	1	44408
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	-	-	3	44409
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	1	-	2	44410
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	-	1	1	44411
KDR 2 for Rittal TS8							
KDR 2-TS8-600	600 mm	458 mm	435 mm	-	-	3	42924
KDR 2-TS8-600	600 mm	458 mm	435 mm	1	-	2	42953
KDR 2-TS8-600	600 mm	458 mm	435 mm	-	1	1	42941
KDR 2-TS8-800	800 mm	658 mm	635 mm	-	-	4	42922
KDR 2-TS8-800	800 mm	658 mm	635 mm	1	-	3	42954
KDR 2-TS8-800	800 mm	658 mm	635 mm	-	1	2	42945
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	-	5	42923
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	1	-	4	42955
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	1	3	42952
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	-	2	42958
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	1	-	1	42957
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	1	1	42959
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	-	-	3	42920
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	1	-	2	42956
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	-	1	1	42943

6



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

* in case both fields of the enclosure are equipped, 2 complete split gland plates are necessary.

MP

Module plates



Product description

The module plates have cut-outs for fixing the KEL range cable entry systems KEL 24, KEL-U 24, KEL-QUICK 24, KEL-JUMBO, KEL-DPF, KEL-JUMBO flex and KEL-ULTRA flex.

- The module plates can be installed on:
- Separation walls by Rittal
 - closed enclosure bases and roofs (various manufacturers)
 - Bases of Lohmeier enclosures
 - Bases of Rittal enclosures via KDR-BMP gland plates

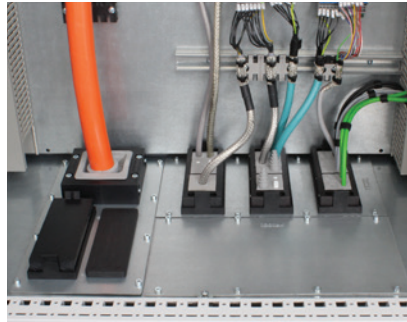
The module blank plate without cut-outs (Order No. 43882) is designed for closing unused cut-outs. This module plate can even be used for self-made cut-outs.

Module plates are supplied with a gasket.

Specifications

Material	Sheet steel, zinc-plated Aluminium (Order No. 43883, 43899)
Dimension	338 × 168 × 2 mm

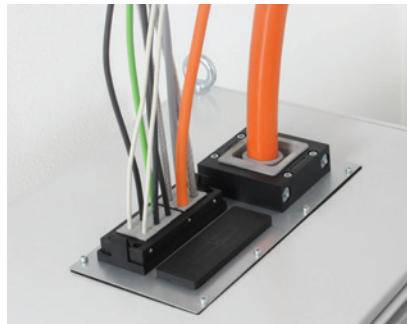
MP Applications



Cable routing via module plates in the base of a Rittal TS8 enclosure. Mounting with icotek gland plate KDR BMP.



Cable routing through the divider panel of a Rittal TS8 baying enclosure system via module plates.



Routing of several cables with and without connectors through a closed enclosure roof via module plates. Cut-out size 314 x 144 mm.

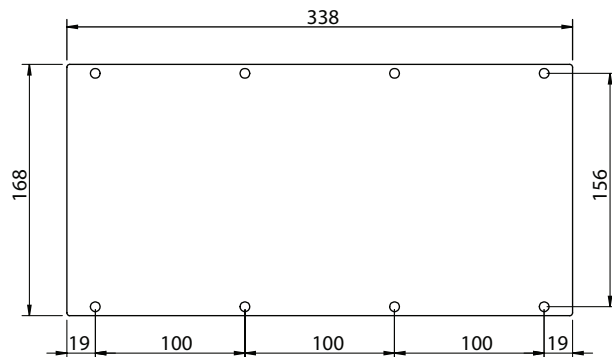


Routing of a rigid supply line through a closed enclosure roof via module plates. Cut-out size 314 x 144 mm.

6

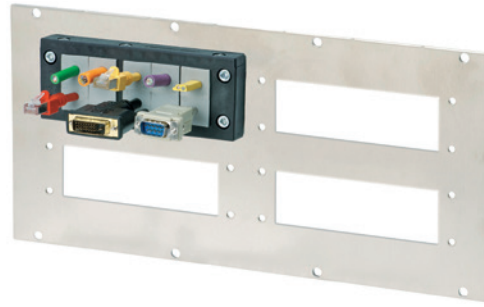
Compatible with

KEL 24 Cable entry frames	17
KEL-U 24 Cable entry frames	13
KEL-QUICK 24 Cable entry frames	70
KEL-SNAP snap frames	34 - 37
KEL-JUMBO Cable entry frames	38
KEL-DPF Cable entry grommets	138 - 139
KEL-JUMBO flex Cable entry ins.	141
KEL-ULTRA flex Cable entry ins.	140
Blank plates	246 - 248


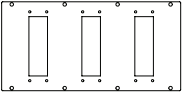
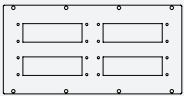
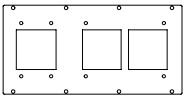
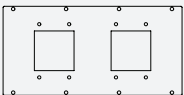
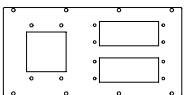
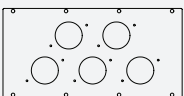
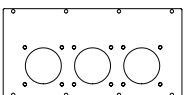
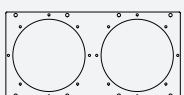
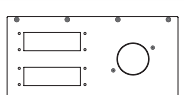



MP

Module plates



IP54

Description	Type	Order No.	Compatible with
	MP 0	43882	Module plate, blank
	MP 1	43891	3× KEL(-U/-QUICK) 24 x
	MP 2	43890	4× KEL(-U/-QUICK) 24 x
	MP 3	43886	1× KEL-JUMBO 1 1× KEL-JUMBO 2
	MP 4	43888	2× KEL-JUMBO 1
	MP 5	43887	2× KEL(-U/-QUICK) 24 x 1× KEL-JUMBO 1
	MP 6	43883	5× cut-out M50 for KEL-DPF or KEL-DPZ
	MP 7	43889	Cut-out 3× KEL-JUMBO flex
	MP 8	43894	Cut-out 2× KEL-ULTRA flex
	MP 10	43896	2× KEL(-U/-QUICK) 24 x 1× cut-out M63 for KEL-DPF or KEL-DPZ
	MP 11	43899	5× cut-out M63 for KEL-DPF or KEL-DPZ

6



KDR-BMP for VX25

Enclosure gland plates for module plates



Product description

The KDR-BMP gland plates are ideally suited for Rittal VX25 enclosures and can be used instead of the 3 piece standard gland plates. The KDR-BMP gland plates are fixed by screwing.

On KDR-BMP gland plates, our MP Module Plates MPo-MP11 can be easily mounted and used for installation of cable entry components.

Note: The division bar can be removed in Rittal enclosures.

Advantages & benefits

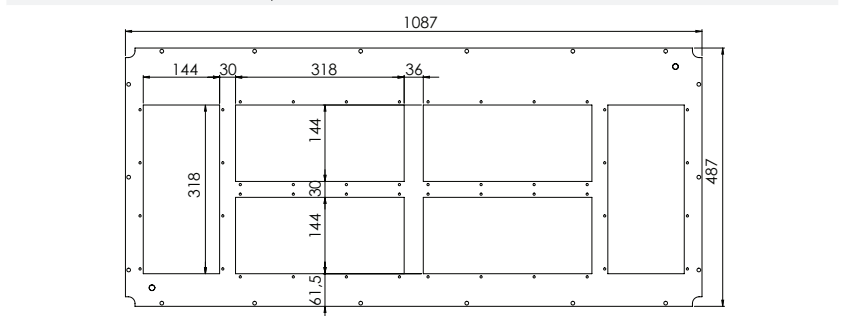
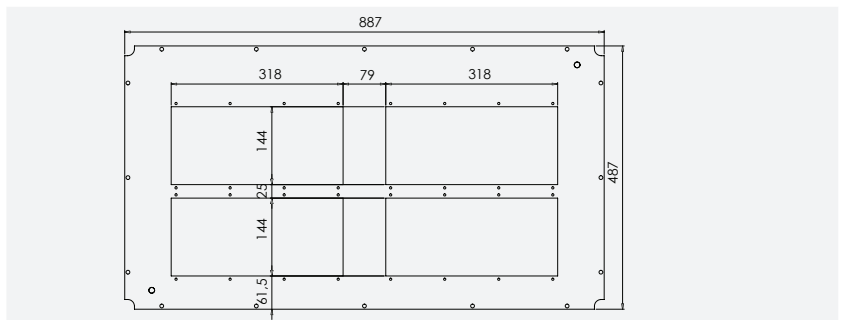
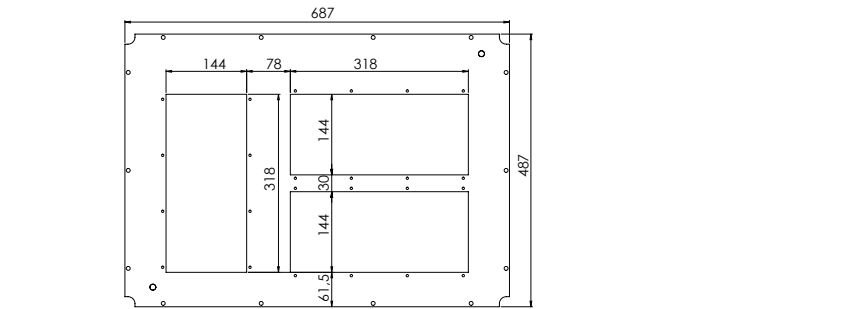
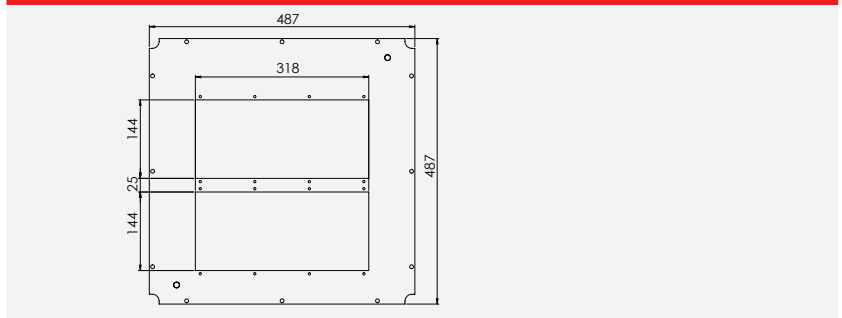
- Very simple mounting
- No sheet metal work required

Specifications

Material	Sheet steel, zinc-plated
IP rating	IP54, with gasket and correct selection of cable entry devices

Compatible with

MP Module plates 230 - 231



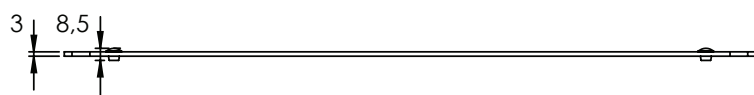
KDR-BMP for VX25

Enclosure gland plates for module plates



Type	Enclosure type	Enclosure width	Enclosure depth	No. of cut-outs for module plates	Order No.
KDR-BMP 600/600	VX25	600 mm	600 mm	2	43334
KDR-BMP 800/600	VX25	800 mm	600 mm	3	43340
KDR-BMP 1000/600	VX25	1000 mm without division bar	600 mm	4	43346
KDR-BMP 1200/600	VX25	1200 mm without division bar	600 mm	6	43352

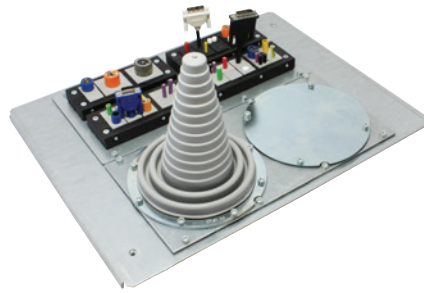
6



KDR-BMP for TS8

Enclosure gland plates for module plates

IP54



Product description

The KDR-BMP gland plates are ideally suited for Rittal TS enclosures and can be used instead of the 3 piece standard gland plates.

Rittal standard mounting clips are used for fixing the plate.

On KDR-BMP gland plates, our MP Module Plates MPo-MP8 can be easily mounted and used for installation of cable entry components.

Advantages & benefits

- Very simple mounting
- No sheet metal work required

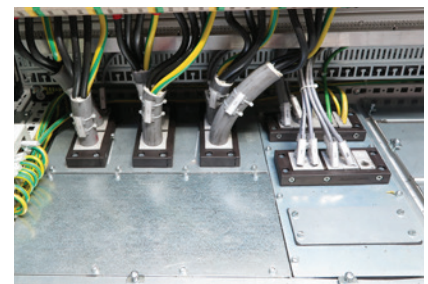
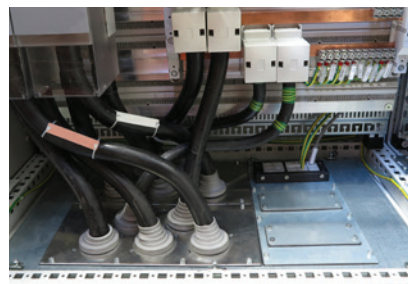
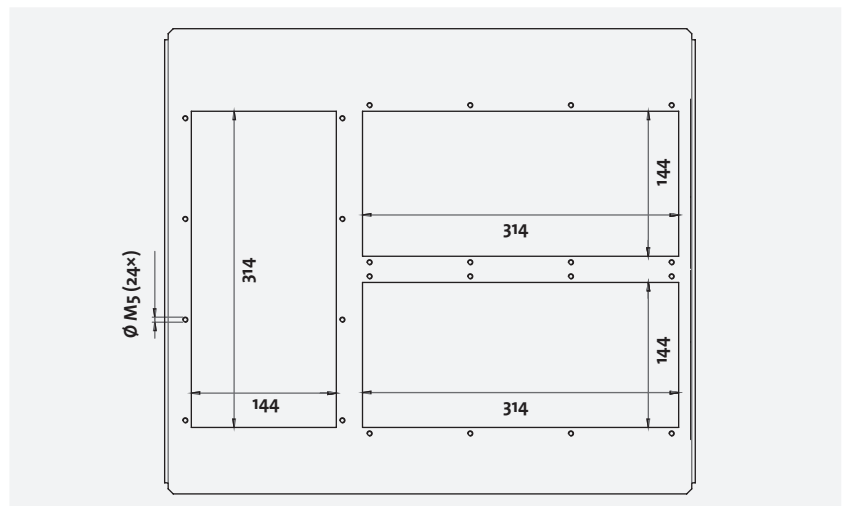
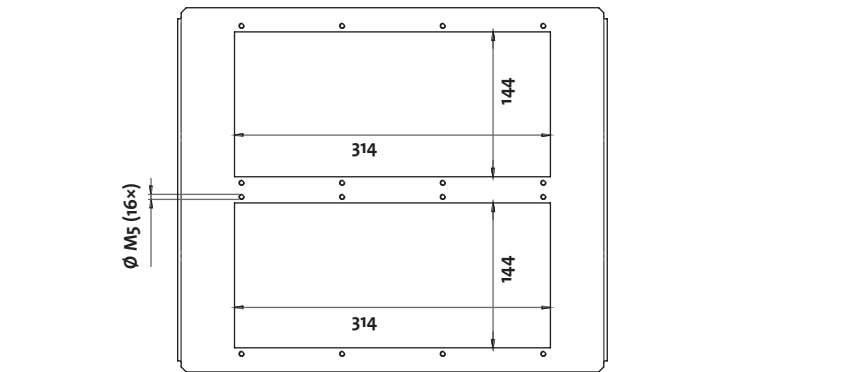
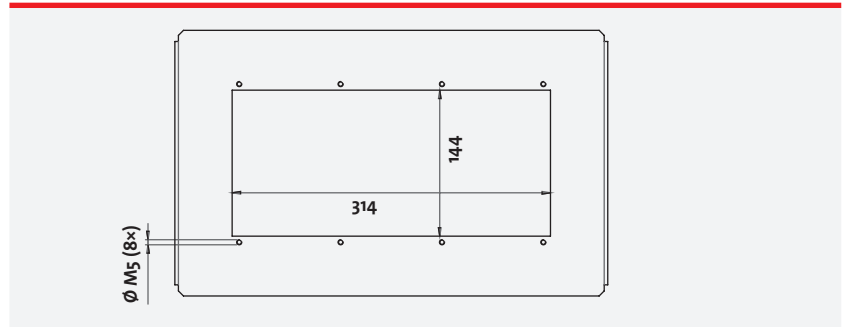
Specifications

Material Sheet steel, zinc-plated
 IP rating IP54, with gasket and correct selection of cable entry devices

Compatible with

MP Module plates 230 - 231

Description



KDR-BMP for TS8

Enclosure gland plates for module plates

IP54

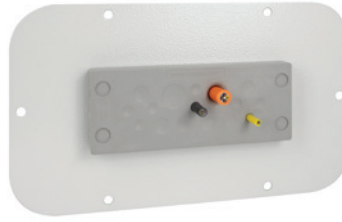
Type	Enclosure type	Enclosure width	Enclosure depth	No. of cut-outs for module plates	Order No.
KDR-BMP 600/400	TS 8	600 mm	400 mm	1	43300
KDR-BMP 600/500	TS 8	600 mm	500 mm	2	43302
KDR-BMP 600/600	TS 8	600 mm	600 mm	2	43304
KDR-BMP 800/400	TS 8	800 mm	400 mm	1	43306
KDR-BMP 800/500	TS 8	800 mm	500 mm	3	43308
KDR-BMP 800/600	TS 8	800 mm	600 mm	3	43310
KDR-BMP 1000/400	TS 8	1000 mm with division bar	400 mm	1	43312
KDR-BMP 1000/500	TS 8	1000 mm with division bar	500 mm	2	43314
KDR-BMP 1000/600	TS 8	1000 mm with division bar	600 mm	2	43316
KDR-BMP 1200/400	TS 8	1200 mm with division bar	400 mm	1	43318
KDR-BMP 1200/500	TS 8	1200 mm with division bar	500 mm	2 × 3	43320
KDR-BMP 1200/600 for left section	TS 8	1200 mm with division bar	600 mm	3	43322
KDR-BMP 1200/600 for right section	TS 8	1200 mm with division bar	600 mm	3	43324



FP-AX

Flange plates for compact enclosures

IP66



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AX series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

Specifications

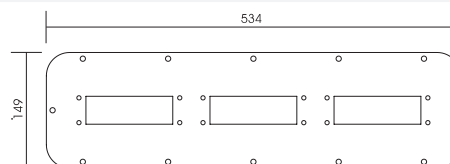
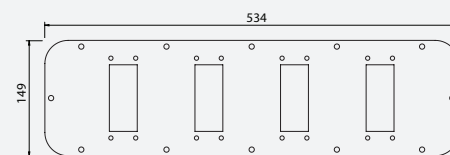
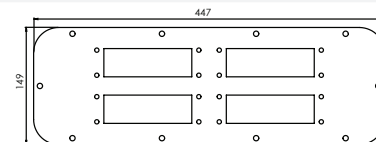
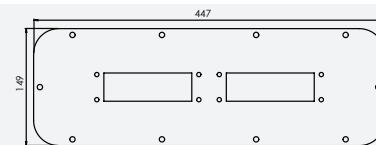
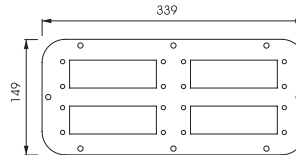
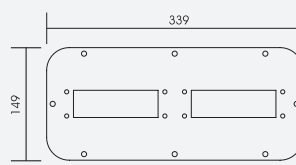
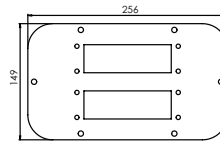
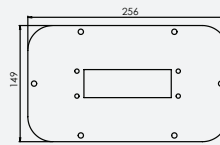
Material Sheet steel, powder coated

6

Compatible with

KEL Cable entry frames	16 - 25
KEL-U Cable entry frames	12 - 14
KEL-QUICK Cable entry frames	70 - 71
KEL-SNAP Mounting frames	34 - 37
KEL-QTA 24 Cable entry frames	77 - 79
KEL-DPU 24 Cable entry plates	100 - 101
KEL-DPZ 24 Cable entry plates	102 - 104
KEL-DP 24 Cable entry plates	115
KEL-BES	254
KEL-BES-S	255
Blank plates	246 - 248

Description



FP-AX

Flange plates for compact enclosures



IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AX 256 149 with 1 cut-out 36 x 112 mm horizontal	43901	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	1	AX 1033.000 AX 1034.000
FP-AX 256 149 with 2 cut-outs 36 x 112 mm horizontal	43902	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	1	AX 1033.000 AX 1034.000
FP-AX AE 339 149 with 2 cut-outs 36 x 112 mm	43840	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	2	AX 1031.000 AX 1380.000 AX 1038.000 AX 1077.000 AX 1100.000 AX 1045.000
FP-AX AE 339 149 with 4 cut-outs 36 x 112 mm	43846	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	2	AX 1031.000 AX 1380.000 AX 1038.000 AX 1077.000 AX 1100.000 AX 1045.000
FP-AX 447 149 with 2 cut-outs 36 x 112 mm horizontal	43903	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AX 1050.000 AX 1057.000
FP-AX 447 149 with 4 cut-outs 36 x 112 mm horizontal	43904	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AX 1050.000 AX 1057.000
FP-AX AE 534 149 with 4 cut-outs 36 x 86 mm	43871	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DP 16	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000
FP-AX AE 534 149 with 3 cut-outs 36 x 112 mm	43842	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000

FP-AX

Flange plates
for compact enclosures



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AX series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

Specifications

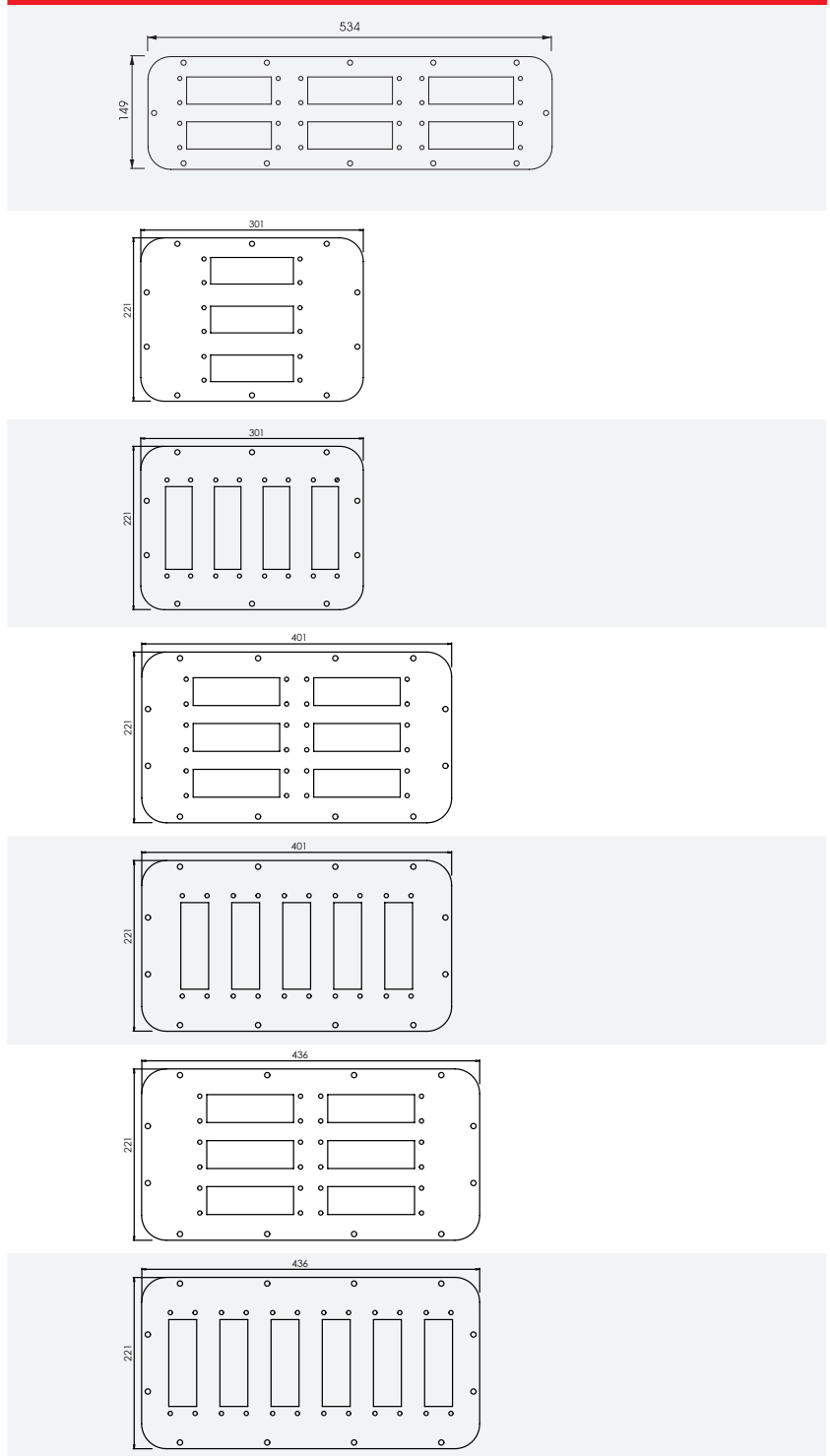
Material Sheet steel, powder coated

6

Compatible with

KEL Cable entry frames	16 - 25
KEL-U Cable entry frames	12 - 14
KEL-QUICK Cable entry frames	70 - 71
KEL-SNAP Mounting frames	34 - 37
KEL-QTA 24 Cable entry frames	77 - 79
KEL-DPU 24 Cable entry plates	100 - 101
KEL-DPZ 24 Cable entry plates	102 - 104
KEL-DP 24 Cable entry plates	115
KEL-BES	254
KEL-BES-S	255
Blank plates	246 - 248

Description



FP-AX

Flange plates
for compact enclosures

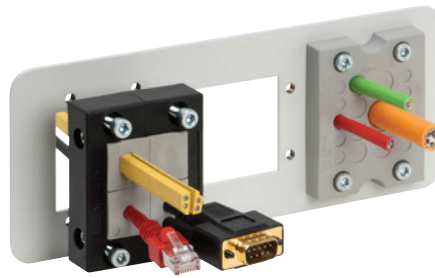


IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AX AE 534 149 with 6 cut-outs 36 x 112 mm	43848	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000
FP-AX 301 221 with 3 cut-outs 36 x 112 mm horizontal, 3 rows	43905	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	AX 1338.000 AX 1037.000 AX 1073.000 AX 1055.000 AX 1180.000 AX 1280.000 AX 1181.000 AX 1281.000
FP-AX 301 221 with 4 cut-outs 36 x 112 mm vertical, 1 row	43906	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	AX 1338.000 AX 1037.000 AX 1073.000 AX 1055.000 AX 1180.000 AX 1280.000 AX 1181.000 AX 1281.000
FP-AX 401 221 with 6 cut-outs 36 x 112 mm horizontal, 3 rows	43907	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	6	AX 1350.000 AX 1130.000 AX 1110.000 AX 1213.000 AX 1114.000 AX 1214.000 AX 1115.000
FP-AX 401 221 with 5 cut-outs 36 x 112 mm vertical, 1 row	43908	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	6	AX 1350.000 AX 1130.000 AX 1110.000 AX 1213.000 AX 1114.000 AX 1214.000 AX 1115.000
FP-AX 436 221 with 6 cut-outs 36 x 112 mm horizontal, 3 rows	43909	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	7	AX 1339.000 AX 1360.000 AX 1376.000 AX 1260.000 AX 1116.000 AX 1059.000 AX 1091.000 AX 1261.000
FP-AX 436 221 with 6 cut-outs 36 x 112 mm vertical, 1 row	43910	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	7	AX 1339.000 AX 1360.000 AX 1376.000 AX 1260.000 AX 1116.000 AX 1059.000 AX 1091.000 AX 1261.000

FP-KX/KL

Flange plates for terminal boxes



Product description

The FP flange plates type KX/KL, designed to fit the Rittal KX/KL series terminal boxes, are installed in combination with a cable entry system for either pre-terminated or standard cables. FP flange plates are pre-cut, pre-drilled and painted for easy and quick installation of icotek cable routing products.

We recommend fastening the cable entry systems with a torque of 1.5 – 2.0 Nm.

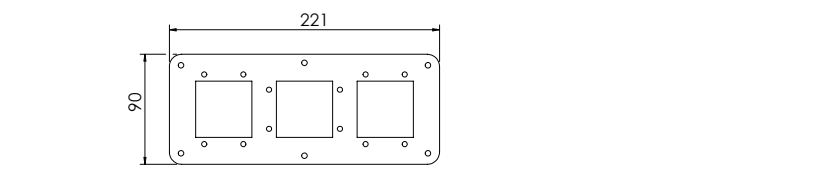
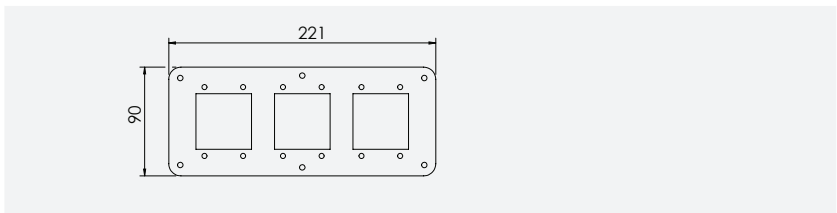
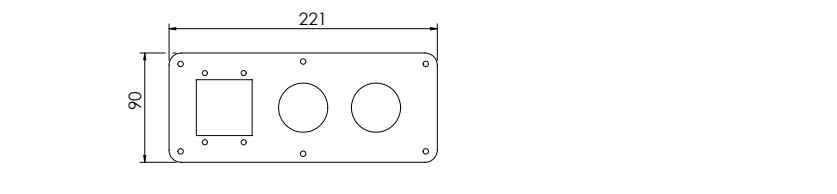
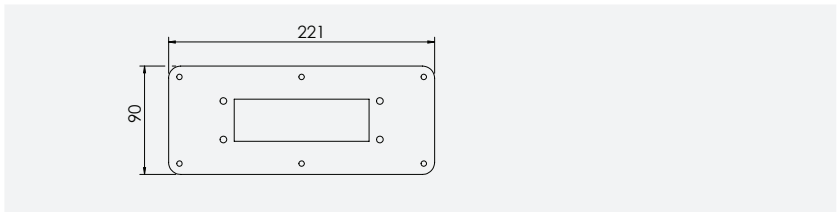
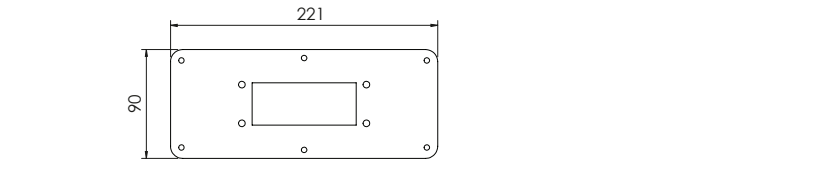
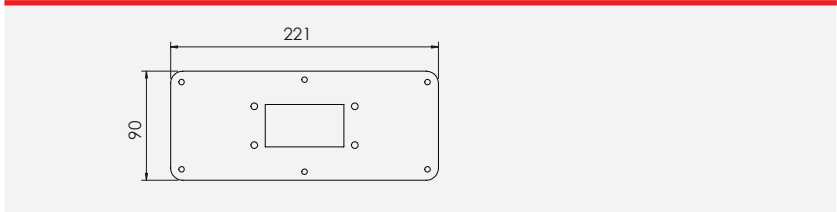
Specifications

Material Sheet steel, powder coated

Compatible with

KEL Cable entry frames	16 - 25
KEL-U Cable entry frames	12 - 14
KEL-QUICK Cable entry frames	70 - 71
KEL-SNAP Mounting frames	34 - 37
KEL-QTA 24 Cable entry frames	77 - 79
KEL-DPU 24 Cable entry plates	100 - 101
KEL-DPZ 24 Cable entry plates	102 - 104
KEL-DP 24 Cable entry plates	115
KEL-BES	254
KEL-BES-S	255
Blank plates	246 - 248

Description



IP65 cable entry plate for Rittal KX and KL:
KEL-DPZ-KX/KL

FP-KX/KL

Flange plates for terminal boxes



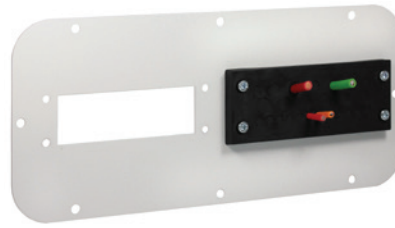
IP55

Type	Order No. RAL 7035	Flange plates compatible with	Size FP	Compatible with
FP-KX/KL 221x90 10 with 1 cut-out 36 x 65 mm	43853	KEL 10 KEL-U 10 KEL-QUICK 10 KEL-SNAP 10 KEL-BES 10 KEL-BES-S 10	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 16 with 1 cut-out 36 x 86 mm	43855	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 24 with 1 cut-out 36 x 112 mm	43834	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 A with 3 cut-outs	43852	KEL-B KEL-U-B KEL-QUICK-B KEL-SNAP-B KEL-DPZ-B KEL-DPZ 40 KEL-DPF 40	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 B with 3 cut-outs 46 x 46 mm	43854	Use with: 2x KEL-SNAP-B and 1x KEL-DPZ-B	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 C with 3 cut-outs 46 x 46 mm	43856	KEL-B KEL-U-B KEL-QUICK-B KEL-DPZ-B	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000 KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000

FP-AE

Flange plates
for compact enclosures

IP66



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AE series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

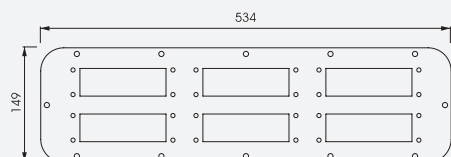
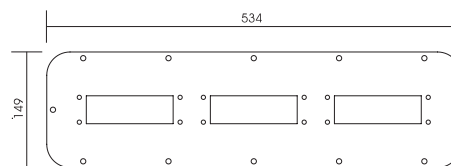
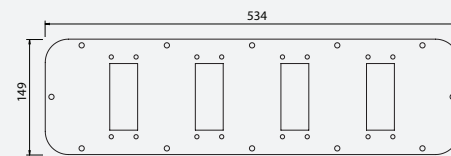
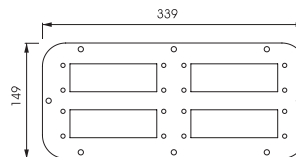
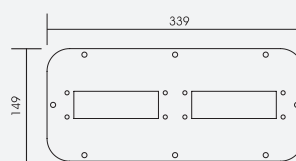
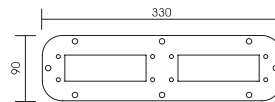
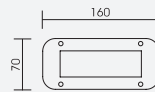
Specifications

Material Sheet steel, powder coated

Compatible with

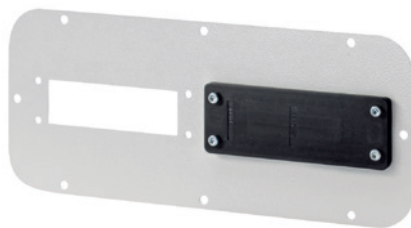
KEL Cable entry frames	16 - 25
KEL-U Cable entry frames	12 - 14
KEL-QUICK Cable entry frames	70 - 71
KEL-SNAP Mounting frames	34 - 37
KEL-QTA 24 Cable entry frames	77 - 79
KEL-DPU 24 Cable entry plates	100 - 101
KEL-DPZ 24 Cable entry plates	102 - 104
KEL-DP 24 Cable entry plates	115
KEL-BES	254
KEL-BES-S	255
Blank plates	246 - 248

Description



FP-AE

Flange plates
for compact enclosures



IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AE 160 70 with 1 cut-out 36 x 112 mm	43836	KEL-QTA 24	KEL-DP 24	1	AE 1032 AE 1035
FP-AE-24 330 90 with 2 cut-outs 36 x 112 mm	43838	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AE 1030 AE 1031 AE 1038 AE 1380
FP-AE-16 330 90 with 2 cut-outs 36 x 86 mm	43861	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DP 16	3	
FP-AX AE 339 149 with 2 cut-outs 36 x 112 mm	43840	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AE 1037 AE 1045 AE 1050 AE 1057 AE 1100 AE 1110 AE 1114 AE 1130 AE 1213 AE 1338 AE 1350
FP-AX AE 339 149 with 4 cut-outs 36 x 112 mm	43846	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	CS 9751.125 CS 9751.145 CS 9751.165 CS 9752.125 TP 6710 TP 6712 TP 6714 TP 6716
FP-AX AE 534 149 with 4 cut-outs 36 x 86 mm	43871	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DP 16	5	AE 1039 AE 1054 AE 1055 AE 1058 AE 1060 AE 1073 AE 1076 AE 1077 AE 1090 AE 1180 AE 1260 AE 1280 AE 1339 AE 1360 AE 1376 AE 1958 EL 1919 EL 1926
FP-AX AE 534 149 with 3 cut-outs 36 x 112 mm	43842	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	IN 1076.290
FP-AX AE 534 149 with 6 cut-outs 36 x 112 mm	43848	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	TP 6711 TP 67113 TP 6715 TP 6717

FP-BG | FP-FL21

Flange plates for bus enclosures



Product description

The FP flange plates type BG, designed to fit the Rittal BG series enclosures, have up to 3 cut-outs that match the dimensions of the standard cut-outs for the 24-pole industrial connectors. These flange plates are installed in combination with a cable entry system for either pre-terminated cables (KEL 24, KEL-U 24 or KEL-QUICK 24) or standard cables (KEL-DPZ 24, KEL-DPU 24 or KEL-DP 24).

We recommend fastening the cable entry systems with a torque of 1.5 – 2.0 Nm.

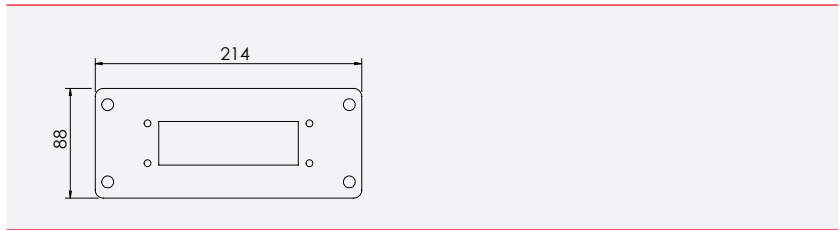
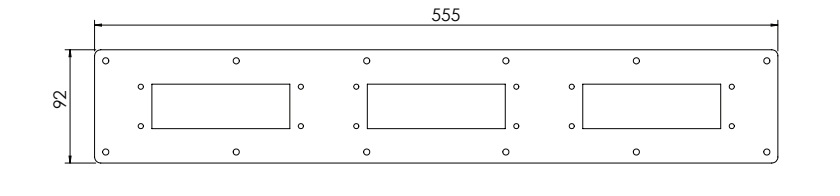
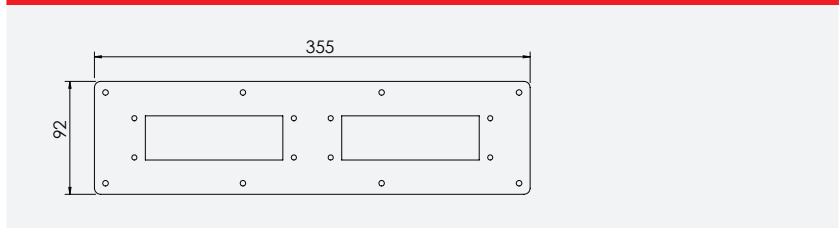
Specifications

Material Sheet steel, powder coated

Compatible with

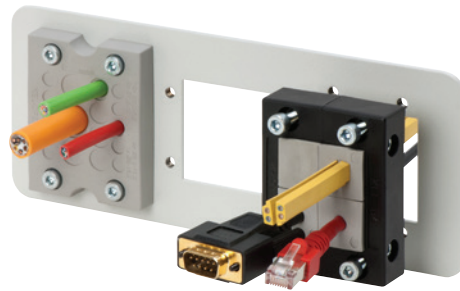
KEL 24 Cable entry frames	16 - 25
KEL-U 24 Cable entry frames	12 - 14
KEL-QUICK 24 Cable entry frames	70 - 71
KEL-SNAP Mounting frames	34 - 37
KEL-QTA 24 Cable entry frames	77 - 79
KEL-DPU 24 Cable entry plates	100 - 101
KEL-DPZ 24 Cable entry plates	102 - 104
KEL-DP 24 Cable entry plates	115
Blank plates	246 - 248

Description



FP-BG | FP-FL21

Flange plates for bus enclosures



IP54

Type	Order No. RAL 7035	Flange plates compatible with	Size FP.	Compatible with
FP-BG 355x92 with 2 cut-outs 36 x 112 mm	43866	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	-	BG 1558.510
FP-BG 555x92 with 3 cut-outs 36 x 112 mm	43865	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	6	BG 1050.900 BG 1559.510 IN 1510.280
FP-FL 21 with 1 cut-out 36 x 112 mm	43832	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	-	Fibox plates

BPK

Blank plates, plastic



BPK-RF

BPK

Product description

BPK Blank plates seal cut-outs for standard 10-pole / 16-pole / 24-pole industrial connectors with IP rating up to IP66.

Plastic blank plates are available in two different versions:

- Type BPK: Blank plates for screw connection
- Type BPK-RF A: Blank plates for snapping into metal sheet plates up to a thickness from 1.5 to 3 mm

Advantages & benefits

- Fast mounting of the blank plates BPK-RF range by snapping into the cut-out
- Integrated circular sealing (up to IP66)

Specifications

Material	Polypropylene (PP)
	Circular sealing: Elastomer
Flame class	UL 94 V-0
IP rating	BPK: IP66 BPK-RF A: IP54
Temperature Properties	-30°C to +140°C (static) Halogen free, silicone free

6

Compatible with

FP Flange plates 236 - 245

Type	Order No.	Blank plate for KEL cut-out	Dimensions	PU
BPK Blank plates for screw connection:				
BPK-B	42010	KEL-B KEL-U-B KEL-ER-B KEL-QUICK-B	76 × 53 mm	10
BPK 10	42015	KEL 10 KEL-U 10 KEL-ER 10 KEL-QUICK 10	101 × 53 mm	10
BPK 16	42016	KEL 16 KEL-U 16 KEL-ER 16 KEL-QUICK 16	121 × 53 mm	10
BPK 24	42024	KEL 24 KEL-U 24 KEL-ER 24 KEL-QUICK 24 KEL-FG-A	148 × 53 mm	10
BPK Blank plates for snapping into cut-outs:				
BPK-B-RF A	42010.002	KEL-B KEL-U-B KEL-QUICK-B	76 × 53 mm	10
BPK 10-RF A	42015.002	KEL 10 KEL-U 10 KEL-QUICK 10	101 × 53 mm	10
BPK 16-RF A	42016.002	KEL 16 KEL-U 16 KEL-QUICK 16	121 × 53 mm	10
BPK 24-RF A	42024.002	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-FG-A	148 × 53 mm	10
BPK-JFX	42620	KEL-JUMBO flex	88 × 88 mm	5



BPK-RF: Snap function, tool-free assembly



BPK: screwable

BPM

Blank plates, metal



IP66

Product description

Blank plates to close cut-outs for standard 6-pole/10-pole/16-pole/24-pole industrial connectors.

Blank plates are supplied with a gasket.

Specifications

Material Steel, zinc-plated
Width 2 mm

IP rating IP66

Compatible with

KDR 2 Split gland plates 198 - 199

FP Flange plates 236 - 245

MP Module plates 230 - 231

NEW

Type	Order No.	Blank plate for KEL cut-out	Dimensions	PU
BPM-E2	42048	KEL-E2 KEL-ER-E2 KEL-FG-E2 KEL-QUICK-E2	73 × 39.5 mm	10
BPM-E3	42049	KEL-E3 KEL-ER-E3 KEL-FG-E3 KEL-QUICK-E3	98 × 39.5 mm	10
BPM-E4	42050	KEL-E4 KEL-ER-E4 KEL-QUICK-E4	120 × 39.5 mm	10
BPM-E5	42051	KEL-E5 KEL-ER-E5 KEL-FG-E5 KEL-QUICK-E5	147 × 39.5 mm	10
BPM-B BPM-B V2A	42013 41996	KEL-B KEL-U-B KEL-ER-B KEL-QUICK-B	75 × 58 mm	10
BPM 6 BPM 6 V2A	42011 41991	Standard 6-pin industrial connectors	90 × 52 mm	10
BPM 10 BPM 10 V2A	42014 41992	KEL 10 KEL-U 10 KEL-ER 10 KEL-QUICK 10	99 × 58 mm	10
BPM-FG-B	42012	KEL-FG-B	80 × 58 mm	10
BPM 16 BPM 16 V2A	42025 41994	KEL 16 KEL-U 16 KEL-ER 16 KEL-QUICK 16	118 × 56 mm	10
BPM 16-E	42023	KEL 16-E	120 × 87 mm	1
BPM 16-MT	42026	KEL 16-MT	120 × 102 mm	1
BPM 16-2MT	42031	KEL 16-2MT	120 × 146 mm	1
BPM 24 BPM 24 V2A	42027 41995	KEL 24 KEL-U 24 KEL-ER 24 KEL-QUICK 24	145 × 56 mm	10
BPM 24-E	42029	KEL 24-E	143 × 83 mm	1
BPM 24-MT	42028	KEL 24-MT	147 × 102 mm	1
BPM-JUMBO flex	42033	KEL-JUMBO flex	88 × 88 mm	1
BPM-JUMBO 1	42030	KEL-JUMBO 1	116 × 110 mm	1
BPM-JUMBO 2	42032	KEL-JUMBO 2	200 × 116 mm	1
BPM-ULTRA	42633	KEL-ULTRA flex	∅ 168 mm Width: 1.5 mm	1

BPK-SNAP

Blank plates for KEL-SNAP frames



Product description

Blank plate BPK-SNAP to close cut-outs of pre-assembled KEL-SNAP frames.

A snap frame can be closed, i.e. during transport to avoid entry of dust, as long as a KEL frame is not mounted.

The BPK-SNAP blank plate is simply snapped on the KEL frame. There is no tool needed to remove it.

BPK-SNAP 16 and BPK-SNAP 24 for closing cut-outs of the KEL-SNAP mounting frames and unused slide frames of the KDR-ESR gland plates.

Type	Order No.	Blank plate compatible with	Dimensions l x b x h	PU
BPK-SNAP-B	42003	KEL-SNAP-B4	58 × 72.8 × 17 mm	10
BPK-SNAP 10	42004	KEL-SNAP 10	58 × 98.3 × 17 mm	10
BPK-SNAP 16	42007	KEL-SNAP 16	58 × 120 × 17 mm	10
BPK-SNAP 24	42017	KEL-SNAP 24	58 × 147 × 17 mm	10
BPK-SNAP 24-E	42008	KEL-SNAP 24-E	83 × 147 × 17 mm	10

Specifications

Material	Polyamide (PA)
Flame class	UL 94 V-0
IP rating	IP54
Temperature	-40°C to +80°C (static)
Properties	Halogen free, silicone free

Compatible with

6




KEL-SNAP Mounting frames	36-37
KDR-ESR Gland plate with Slide frames	218 - 227



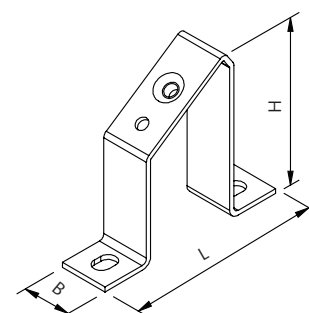
MF

Supports for DIN rails and bus bars



Description	Type	Version	Order No. without Clip	Order No. with Clip	Dimension [L x B x H]	PU	
	Type A	MF-A49	Type A	36056	36058	80 x 20 x 49 mm	10
		MF-A68	Type A	36064	36066	80 x 20 x 68 mm	10
		MF-A88	Type A	36072	36074	80 x 20 x 88 mm	10
	Type B	MF-B20	Type B	36000	36002	80 x 20 x 20 mm	10
		MF-B30	Type B	36008	36010	80 x 20 x 30 mm	10
		MF-B50	Type B	36016	36018	80 x 20 x 50 mm	10
	Type C	MF-B90	Type B	36024	36026	80 x 20 x 90 mm	10
		MF-C40	Type C	36032	36034	40 x 18 x 40 mm	10
	Type D	MF-C53	Type C	36040	36042	40 x 18 x 53 mm	10
		MF-D49	Type D	36048	36050	120 x 20 x 49 mm	10
	Bus bar 10 x 3 mm	-	-	36100	-	10 x 3 x 1000 mm*	1

* Other lengths available on request



Product description

There are 4 models of supports for mounting bus bars 10 x 3 mm or 35 mm DIN rails. Various supports are available to provide solutions for different conditions.

A mounting clip is used for fastening the bus bar to the supports. The support has M6 female screw threads to affix the mounting clip of the DIN rail with a M6 screw.

Mounting clip
Order No. 36150

Advantages & benefits

- Wide variety of supports with different sizes and designs
- Simple assembly of TS35 DIN rails and 10 x 3 mm bus bars
- Support type D provides possibility to affix 2 TS335 DIN rails

Specifications

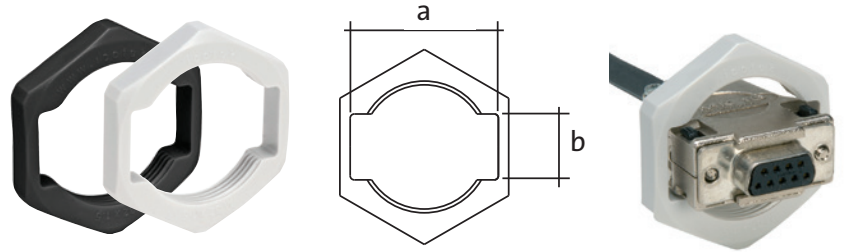
Material Sheet steel, galvanically zinc-plated

Accessories

Bus bar Order No. 36100
Mounting clip Order No. 36150

KGM | GMT

Locknuts



Type KGM: SUB-D9, PB, SUB-D25

Product description

Hexagonal locknut with metric threads for attaching components together.

For routing SUB-D, DVI or PROFIBUS connectors in combination with the split cable glands KVT/QVT, special locknuts with suitable cut-outs are required:

KGM-SUB-D9 fits D-Sub 9 connectors
(Required wall cut-out: Ø 36 mm)

KGM-PB fits DVI and PROFIBUS connectors
(Required wall cut-out: Ø 42 mm)

KGM-SUB-D25 fits SUB-D25 connectors
(Required wall cut-out: Ø 50 - 54 mm)

Split hexagonal locknuts GMT for use in combination with split cable glands KVT/QVT whenever pre-terminated cables are routed inside cable protection conduits through a machine or cabinet wall. Suitable for split corrugated conduits CONFIX WST.

Specifications

Material	Polyamide (PA) / Polycarbonate (PC)
Colour	<input type="checkbox"/> grey (similar RAL 7035) <input type="checkbox"/> black
Flame class	UL 94 V-0, self-extinguishing
Temperature	- 30°C to + 120°C
Properties	Halogen free, silicone free



Type KGM: Standard nut, plastic



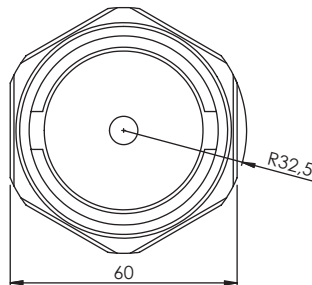
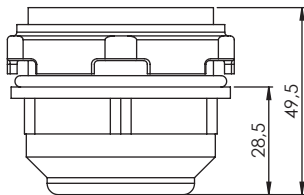
Type GMT: Split locknut

Thread	Type	Order No.	Material	Height [mm]	Wrench size	Diagonal [mm]	Cut-out a x b [mm]	PU
Type KGM: Standard nut, plastic								
M16 x 1.5	KGM 16	<input type="checkbox"/> 52272 <input type="checkbox"/> 52283	PA	4.3	SW 22.8	28.2	-	10
M20 x 1.5	KGM 20	<input type="checkbox"/> 52273 <input type="checkbox"/> 52283	PA	7	SW 26	28.2	-	10
M25 x 1.5	KGM 25	<input type="checkbox"/> 52274 <input type="checkbox"/> 52284	PA	7	SW 32	36	-	10
M32 x 1.5	KGM 32	<input type="checkbox"/> 52275 <input type="checkbox"/> 52285	PA	7	SW 41	46	-	10
M40 x 1.5	KGM 40	<input type="checkbox"/> 52276 <input type="checkbox"/> 52286	PA	7	SW 50	56	-	10
M50 x 1.5	KGM 50	<input type="checkbox"/> 52277 <input type="checkbox"/> 52287	PA	8.5	SW 60	66	-	10
M63 x 1.5	KGM 63	<input type="checkbox"/> 52278 <input type="checkbox"/> 52288	PA	8.5	SW 75	83	-	5
M75 x 1.5	KGM 75	<input type="checkbox"/> 52289	PA	8.5	SW 85	93.1	-	5
M85 x 2	KGM 85	<input type="checkbox"/> 52290	PA	10	SW 100	109.5	-	5
Type KGM: PB, SUB-D9, SUB-D25								
M32 x 1.5	KGM-SUB-D9	<input type="checkbox"/> 45105 <input type="checkbox"/> 45106	PC	7	SW 41	46	35 x 16	10
M40 x 1.5	KGM-PB	<input type="checkbox"/> 45107 <input type="checkbox"/> 45109	PC	8	SW 50	55	43 x 17	10
M50 x 1.5	KGM-SUB-D25	<input type="checkbox"/> 45108 <input type="checkbox"/> 45110	PC	8	SW 60	66	55 x 16	10
Type GMT: Split locknut								
M16 x 1.5	GMT 16	<input type="checkbox"/> 31105	PA	8	SW 19	21	-	10
M20 x 1.5	GMT 20	<input type="checkbox"/> 31110	PA	9	SW 27	29	-	10
M25 x 1.5	GMT 25	<input type="checkbox"/> 31100	PA	9	SW 32	35	-	10
M32 x 1.5	GMT 32	<input type="checkbox"/> 31120	PA	12	SW 40	44	-	10
M40 x 1.5	GMT 40	<input type="checkbox"/> 31130	PA	15	SW 48	53	-	10
M50 x 1.5	GMT 50	<input type="checkbox"/> 31140	PA	15	SW 63	69	-	10

Drainage Device



Type	Dimension ϕ	Cut-out ϕ	Order No.	PU
Drainage Device for M50 hole	60 mm	50 mm	99193	1



Product description

In enclosures and housings with a high degree of protection, temperature differences result in condensation. By using a drainage device, it is possible to safely drain off the condensate without losing a maximum enclosure protection of IP66. A water-permeable membrane ensures the drainage of the enclosure due to its capillary effect. The design prevents splash water from entering the interior of the enclosure.

Advantages

- High protection class IP66/67, IP69K
- Good drainage performance
- Easy assembly
- Based on a standard cut-out
- Sturdy, weatherproof and UV-resistant housing

Specifications

Water entry level	0 mm (at 0.5 mm wall thickness)
Gasket	Sealing gasket NBR
Water permeability	approx. 200 ml/h with a water column of 5 mm
Mounting position	horizontal, lowest point
Temperature	-45 to +70°C

Assembly

The drainage device is fixed in the bottom of the enclosure using the union nut in a hole of ϕ 50.5 +0.5 mm. Make sure that the sealing ring is on the outer housing wall and that the hole is free of burrs.



Wrenches

for M75/M85 plastic locknuts

For mounting the new KEL-DPF sizes we offer suitable wrenches with widths for M75 and M85 plastic locknuts. Material: aluminium

M75: Order No.61436 | M85: Order No. 61437 | PU: 1

7 Cable pass-through with brush seal

Brush plates and brush strips for enclosures, server racks and machines

RoHS compliant Made in Germany

icotek offers cable pass-through solutions with brush seals that are perfectly suitable for applications where no high sealing rate is required. The icotek brush seal solutions are meant for dust and dirt-proof cable pass-through of cables with and without preassembled connectors.

The application areas for a cable pass-through with brush seal are very versatile, e.g. in an electrical enclosure, a server rack, on a machine wall or on raised floors. icotek brush plates and brush strips are a cost-effective solution for a professional cable management.

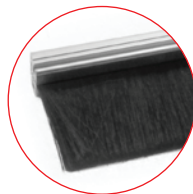
The brush seal solutions allow reduced airflow while filtering out dust and larger particles. Thermal protection and visual screening are additional benefits. icotek brush plates also protect cables against wear due to sharp edges of the cut-out.

For cable pass-through applications in base areas of enclosures and server racks by numerous manufacturers and for wide cut-outs on machine walls icotek offers the universal brush strip KDR-BES-U. Due to the innovative clamp profile the brush strip can be clamped on any sheet metal edge, even in a 90° angle.

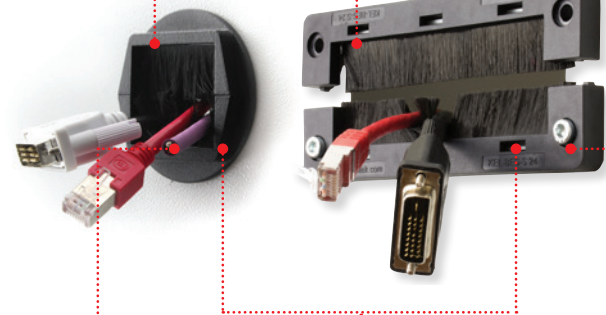
The 2-piece enclosure gland plates KDR-BES and flange plates FP-AX-BES are pre-equipped with brush strips and serve as dust- and dirt-tight cable pass-through.



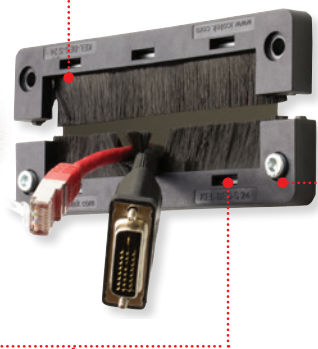
Quick and easy assembly, partly without tools



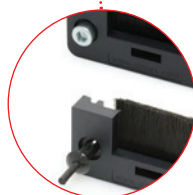
Customization possible



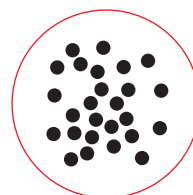
Round versions for screw-in or snap-in assembly



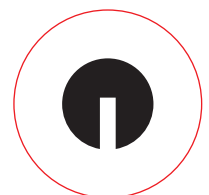
For metric or standard cut-outs



Screw mounting or mounting via expanding rivets possible



Protection against dust



Protection against wear due to sharp edges of the cut-out

Chapter content



Brush plate
for cable pass-through

KEL-BES

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Split brush plate
for cable pass-through

KEL-BES-S

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Rittal / Hoffman / Others
Universal brush strip
for enclosures

KDR-BES-U / KDR-BES-U-VX25 / KDR-BES-U-TS8 /
KDR-BES-U-HG2 / KDR-BES-U-HW /
KDR-BES-U-SSP / KDR-BES-U-ELDON /
KDR-BES-U-ETA

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Rittal
Enclosure gland plates
with brush grommets

KDR-BES-TS8

262 – 263



Rittal
Split flange plates
with brush strips

FP-AX-BES-U

264 – 265

KEL-BES

Brush plate
for cable pass-through



Product description

Brush plates KEL-BES for routing cables into server racks, control panels and electrical enclosures. KEL-BES is also an ideal solution for entry and exit of cables that are routed inside raised floors, e.g. in datacentres or IT closets. The brush plates can either be mounted via screws or via expanding rivets.

The KEL-BES plates match exactly the cut-out dimensions for 10-, 16- or 24-pin standard industrial connectors.

Advantages & benefits

- Fast and easy assembly (optional: snap in assembly)
- Versatile utilisation
- Filtering out dust, hair and larger particulate matter
- Visual screening
- Protects cables against wear due to sharp edges of the cut-out

Specifications

Material	Frame, rectangular: Polyamide (PA) (Flame class UL 94 V-0) Brushes: Polyamide (PA) Brush profile: sheet steel, zinc plated
Temperature	-20°C to +90°C
Properties	Halogen-free, silicone-free
Frame depth	10 mm

7

Accessories

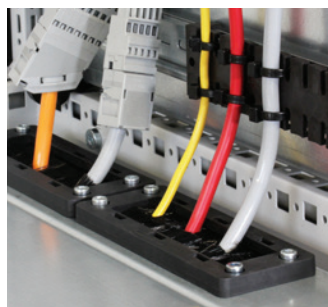
KEL-EMC-PF Cable collectors 187

Description	Type	Order No.	Cut-out	PU
	KEL-BES 24	51515	36 x 112 mm	10

	KEL-BES 16	51510	36 x 86 mm	10
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	KEL-BES 10	51505	36 x 65 mm	10
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	Expanding rivets	99153	For wall thickness 1-4 mm	100
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Suitable for control panel construction



... as well as for energy and building technology

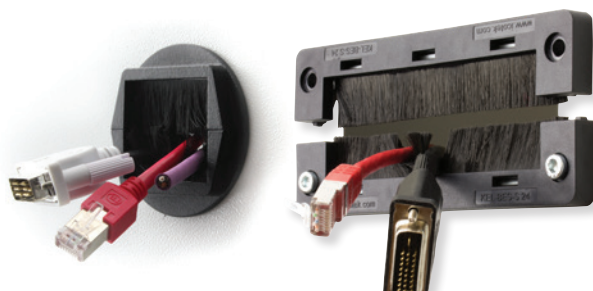


Screw mounting or mounting via expanding rivets possible



Round version with M50 thread for locknut or snap-in mounting

KEL-BES-S

Split brush plate
for cable pass-through

Description	Type	Order No.	Cut-out	PU
	KEL-BES-S 24	51522	36 x 112 mm	10
	KEL-BES-S 24 with expanding rivets	51522.002	36 x 112 mm	10
	KEL-BES-S 16	51521	36 x 86 mm	10
	KEL-BES-S 16 with expanding rivets	51521.002	36 x 86 mm	10
	KEL-BES-S 10	51520	36 x 65 mm	10
	KEL-BES-S 10 with expanding rivets	51520.002	36 x 65 mm	10
	Expanding rivets	99153	For wall thickness 1-4 mm	100
	KEL-BES-S 50	51540	M50 x 1.5 Snap-in function for wall thickness 1 - 2.5 mm	10
	KEL-BES-S 32	51538	M32 x 1.5 Snap-in function for wall thickness 1 - 2.5 mm	10

Product description

Split brush plates KEL-BES-S for routing cables into server racks, control panels and electrical enclosures. The brush plates can either be mounted via screws or via expanding rivets. Due to the split frame the KEL-BES-S can also be subsequently installed around the routed cables. The KEL-BES-S frames match exactly the cut-out dimensions for 10-, 16- or 24-pin standard industrial connectors.

For round metric cut-outs M32/M50 icotek offers the split KEL-BES-S 32/50. It can be either directly snapped into the cut-out or screwed with a locknut.

Advantages & benefits

- Fast and easy assembly (optional: snap in assembly)
- Subsequent assembly possible
- Versatile utilisation
- Filtering out dust, hair and larger particulate matter
- Visual screening
- Protects cables against wear due to sharp edges of the cut-out

Specifications

Material	Frame, rectangular: Polyamide (PA) Frame, round: Polycarbonate (PC) (Flame class UL94-Vo) Brushes: Polyamide (PA) Brush profile: sheet steel, zinc plated
Temperature	- 20°C to + 90°C
Properties	Halogen-free, silicone-free
Frame depth	10 mm

Accessories

KEL-EMC-PF Cable collectors 187

KDR-BES-U

Universal brush strip
for enclosures



Product description

Cable pass-through brush strip for enclosure bases or individual cut-outs on cabinets, enclosures, panels, server racks or machine walls. Due to the innovative and universal clamp strip the brush can also be assembled in a 90° angle, e.g. on bent sheet metal. Suitable for wall thickness 1.5 - 2 mm or 2.5 - 3 mm. Brush may be removed from the profile at any time and remounted using other mounting options.

The KDR-BES-U brush strip is adaptable to almost any enclosure or cabinet type on the market. The standard gland plates included in the enclosure delivery can be used for assembly. They do not have to be changed.

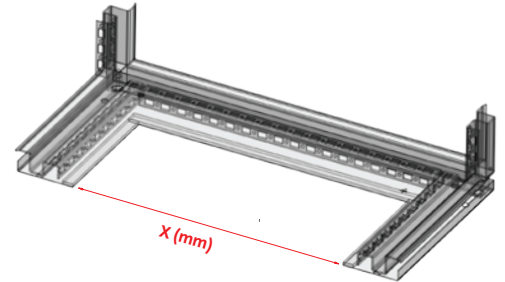
Advantages & benefits

- Fast, simple and tool-free mounting
- Original enclosure gland plates can be used
- Three mounting types possible
- Brush may be remounted at any time using other mounting options
- Available in any custom length up to 1.500 mm

Specifications

Material clamp strip	Aluminium
Material backing strips	Metal, galvanised
Material bristles	Polyamide (PA)
For sheet thickness	1.5 - 2 mm, 2.5 - 3 mm
Temperature	-20°C to +90°C
Properties	Halogen free, silicone free

Brush strips in your required length (up to 1.500 mm)



X (mm) = sight size of base opening
X max. = 1500 mm

Order numbers examples:

For sheet thickness 1.5 - 2 mm, trim height 35 mm:
X = **999** mm → Order No. 58210.**0999**

For sheet thickness 2.5 - 3 mm, trim height 35 mm:
X = **999** mm → Order No. 58225.**0999**

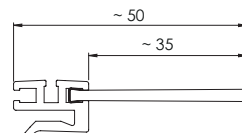
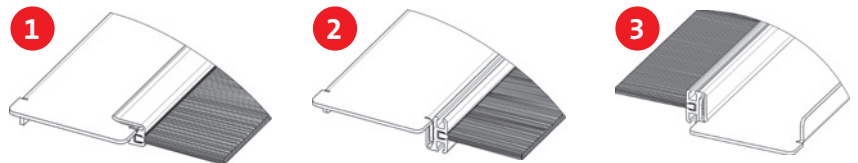
For sheet thickness 1.5 - 2 mm, trim height 50 mm:
X = **999** mm → Order No. 58215.**0999**

For sheet thickness 2.5 - 3 mm, trim height 50 mm:
X = **999** mm → Order No. 58230.**0999**

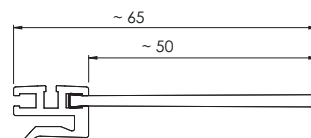
Scope of delivery:

1x KDR-BES-U (clamp strip + brush)

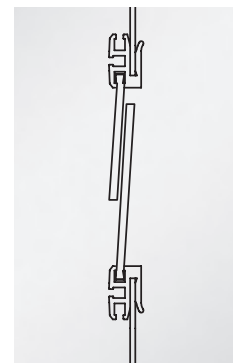
KDR-BES-U mounting options



pure brush length: 35 mm



pure brush length: 50 mm



Two brush strips arranged in opposite directions

KDR-BES-U

Brush strip for gland plates
Rittal VX25/TS 8 & Hoffman PROLINE G2



Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for Rittal VX25 enclosures						
KDR-BES-U-VX25-600	Rittal VX25	600 mm	452 mm	35 mm	58225.0452	1
KDR-BES-U-VX25-800	Rittal VX25	800 mm	652 mm	35 mm	58225.0652	1
KDR-BES-U-VX25-1000	Rittal VX25	1000 mm* with division bar	402 mm	35 mm	58225.0402	1
KDR-BES-U-VX25-1200	Rittal VX25	1200 mm* with division bar	502 mm	35 mm	58225.0502	1
KDR-BES-U-VX25-600	Rittal VX25	600 mm	452 mm	50 mm	58230.0452	1
KDR-BES-U-VX25-800	Rittal VX25	800 mm	652 mm	50 mm	58230.0652	1
KDR-BES-U-VX25-1000	Rittal VX25	1000 mm* with division bar	402 mm	50 mm	58230.0402	1
KDR-BES-U-VX25-1200	Rittal VX25	1200 mm* with division bar	502 mm	50 mm	58230.0502	1
KDR-BES-U for Rittal TS8 enclosures						
KDR-BES-U-TS8-600	Rittal TS8	600 mm	435 mm	35 mm	58210.0435	1
KDR-BES-U-TS8-800	Rittal TS8	800 mm	635 mm	35 mm	58210.0635	1
KDR-BES-U-TS8-1000	Rittal TS8	1000 mm* with division bar	397 mm	35 mm	58210.0397	1
KDR-BES-U-TS8-1000	Rittal TS8	1000 mm without division bar	835 mm	35 mm	58210.0835	1
KDR-BES-U-TS8-1200	Rittal TS8	1200 mm* with division bar	495 mm	35 mm	58210.0495	1
KDR-BES-U for Hoffman PROLINE G2 enclosures						
KDR-BES-U-HG2-600	Hoffman PROLINE G2	600 mm / 1200 mm*	362 mm	35 mm	58210.0362	1
KDR-BES-U-HG2-800	Hoffman PROLINE G2	800 mm	562 mm	35 mm	58210.0562	1
KDR-BES-U-HG2-1000	Hoffman PROLINE G2	1000 mm	762 mm	35 mm	58210.0762	1
Edge protection trim	universal	Clamping range 1-2 mm			99152	100 m



Edge protection trim (100 m)
Order No. 99152

* in case both fields of the enclosure are equipped, 2 brush strips KDR-BES-U are necessary.

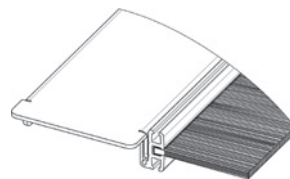
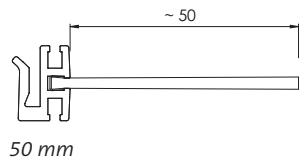
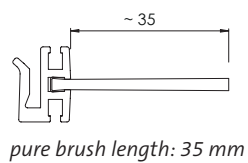
KDR-BES-U

Brush strip for Häwa enclosures



Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for Häwa enclosures series H395 and series H390						
KDR-BES-U HW-600	Häwa	600 mm	392 mm	35 mm	58210.0392	1
KDR-BES-U HW-800	Häwa	800 mm	592 mm	35 mm	58210.0592	1
KDR-BES-U HW-1000	Häwa	1000 mm	792 mm	35 mm	58210.0792	1
KDR-BES-U HW-1200	Häwa	1200 mm	992 mm	35 mm	58210.0992	1
KDR-BES-U HW-600	Häwa	600 mm	392 mm	50 mm	58215.0392	1
KDR-BES-U HW-800	Häwa	800 mm	592 mm	50 mm	58215.0592	1
KDR-BES-U HW-1000	Häwa	1000 mm	792 mm	50 mm	58215.0792	1
KDR-BES-U HW-1200	Häwa	1200 mm	992 mm	50 mm	58215.0992	1

These brush strips KDR-BES-U are suitable for Häwa enclosures series H395 and series H390.



Mounting option Häwa



i icotek also produces brush strips for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!

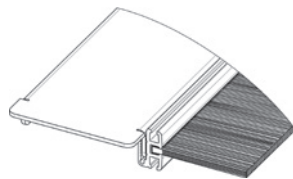
KDR-BES-U

Brush strip for Schneider Electric enclosures

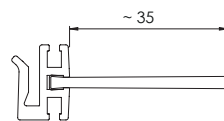


Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for Schneider Electric enclosures series Spacial SF						
KDR-BES-U SSP-600	Schneider Electric	600 mm	414 mm	35 mm	58210.0414	1
KDR-BES-U SSP-800	Schneider Electric	800 mm	614 mm	35 mm	58210.0614	1
KDR-BES-U SSP-1000	Schneider Electric	1000 mm	814 mm	35 mm	58210.0814	1
KDR-BES-U SSP-1200	Schneider Electric	1200 mm *	477 mm	35 mm	58210.0477	1
KDR-BES-U SSP-600	Schneider Electric	600 mm	414 mm	50 mm	58215.0414	1
KDR-BES-U SSP-800	Schneider Electric	800 mm	614 mm	50 mm	58215.0614	1
KDR-BES-U SSP-1000	Schneider Electric	1000 mm	814 mm	50 mm	58215.0814	1
KDR-BES-U SSP-1200	Schneider Electric	1200 mm *	477 mm	50 mm	58215.0477	1

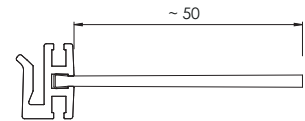
These brush strips KDR-BES-U are suitable for Schneider Electric enclosures series Spacial SF.



Mounting option
Schneider Electric



pure brush length: 35 mm



50 mm



* in case both fields of the enclosure are equipped, 2 brush strips KDR-BES-U are necessary.

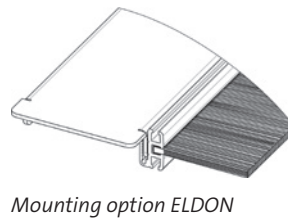
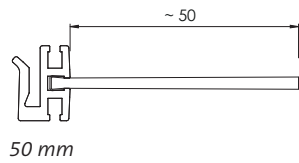
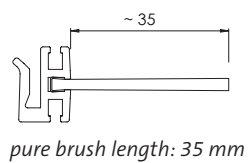
KDR-BES-U

Brush strip for ELDON enclosures



Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for ELDON/nVent enclosures type MCD, MCS, MKS und MKD						
KDR-BES-U Eldon 600	ELDON/nVent	600 mm	435 mm	35 mm	58221.0435	1
KDR-BES-U Eldon 800 + 1600	ELDON/nVent	800 mm 1600 mm *	635 mm	35 mm	58221.0635	1
KDR-BES-U Eldon 1000	ELDON/nVent	1000 mm	835 mm	35 mm	58221.0835	1
KDR-BES-U Eldon 1200	ELDON/nVent	1200 mm *	495 mm	35 mm	58221.0495	1
KDR-BES-U Eldon 600	ELDON/nVent	600 mm	435 mm	50 mm	58222.0435	1
KDR-BES-U Eldon 800 + 1600	ELDON/nVent	800 mm 1600 mm *	635 mm	50 mm	58222.0635	1
KDR-BES-U Eldon 1000	ELDON/nVent	1000 mm	835 mm	50 mm	58222.0835	1
KDR-BES-U Eldon 1200	ELDON/nVent	1200 mm *	495 mm	50 mm	58222.0495	1

These brush strips KDR-BES-U are suitable for ELDON/nVent enclosures type MCD, MCS, MKS und MKD.



i icotek also produces brush strips for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!

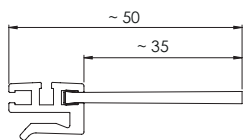
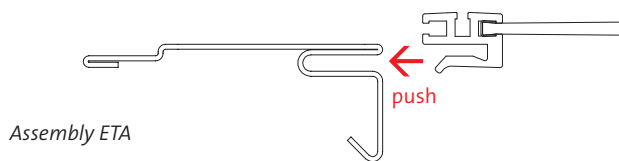
KDR-BES-U

Brush strip
for ETA enclosures

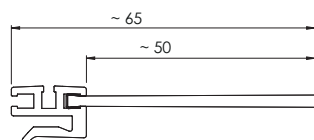


Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for ETA enclosures type E NUX						
KDR-BES-U 600 ETA E NUX	ETA	600 mm	363 mm	35 mm	58221.0363	1
KDR-BES-U 800 ETA E NUX	ETA	800 mm	563 mm	35 mm	58221.0563	1
KDR-BES-U 1000 ETA E NUX	ETA	1000 mm *	345 mm	35 mm	58221.0345	1
KDR-BES-U 1200 ETA E NUX	ETA	1200 mm *	445 mm	35 mm	58221.0445	1
KDR-BES-U 600 ETA E NUX	ETA	600 mm	363 mm	50 mm	58222.0363	1
KDR-BES-U 800 ETA E NUX	ETA	800 mm	563 mm	50 mm	58222.0563	1
KDR-BES-U 1000 ETA E NUX	ETA	1000 mm *	345 mm	50 mm	58222.0345	1
KDR-BES-U 1200 ETA E NUX	ETA	1200 mm *	445 mm	50 mm	58222.0445	1

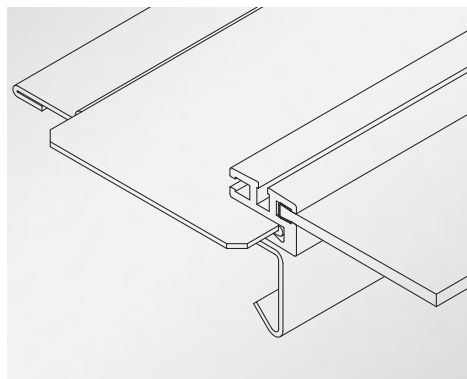
These brush strips KDR-BES-U are suitable for ETA enclosures type E NUX.



pure brush length: 35 mm



50 mm



KDR-BES

Enclosure gland plate
with brush grommets

Product description

The 2-piece enclosure gland plates KDR-BES are supplied with preassembled brush grommets.

The gland plates are installed with standard Rittal clips.

Depending on the maximum cable diameter to be routed, the 2 halves of the brush gland plate are aligned further or closer to each other.

The gland plates KDR-BES are perfect for protection of the enclosure interiors against dirt.

Advantages & benefits

- During assembly, almost the complete base of the enclosure can be used for installation of cables.
- Retrofitting is possible without disconnecting of cables. All can be installed around the cables.
- The gland plates KDR-BES are designed for Rittal enclosures TS8. Other sizes can be supplied on request.

Specifications

Material	Gland plate: Sheet steel, zinc-plated Brush grommets: Polyamide (PA)
Temperature	-20°C to +90°C (static)
Properties	Halogen free, silicone free

Accessories

ZL Strain relief plates	145 - 147
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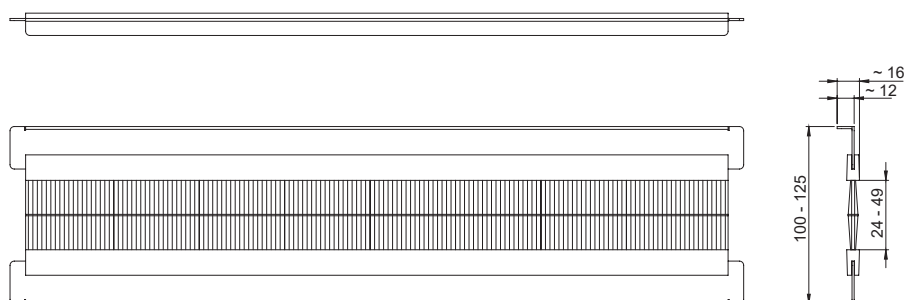
KDR-BES Assembly



KDR-BES

Enclosure gland plate
with brush grommets

Type	Enclosure type	Enclosure width	Total length gland plate	Sight size of base plate opening	Order No.
KDR-BES-TS 8-600	Rittal TS8	600 mm	458 mm	435 mm	58000
KDR-BES-TS 8-800	Rittal TS8	800 mm	658 mm	635 mm	58006
KDR-BES-TS 8-1000	Rittal TS8	1000 mm without division bar	858 mm	835 mm	58012
KDR-BES-TS 8-1200	Rittal TS8	1200 mm*	518 mm	495 mm	58018



* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

FP-AX-BES-U

Split flange plates with brush strips



Product description

Two-part flange plates, each with two brush strips arranged in opposite directions with different trim heights (1 x 35 mm and 1 x 50 mm). They enable the routing of cables already pre-assembled with connectors and prevent dirt from entering the enclosure. The flange plates are designed for Rittal enclosures of type AX.

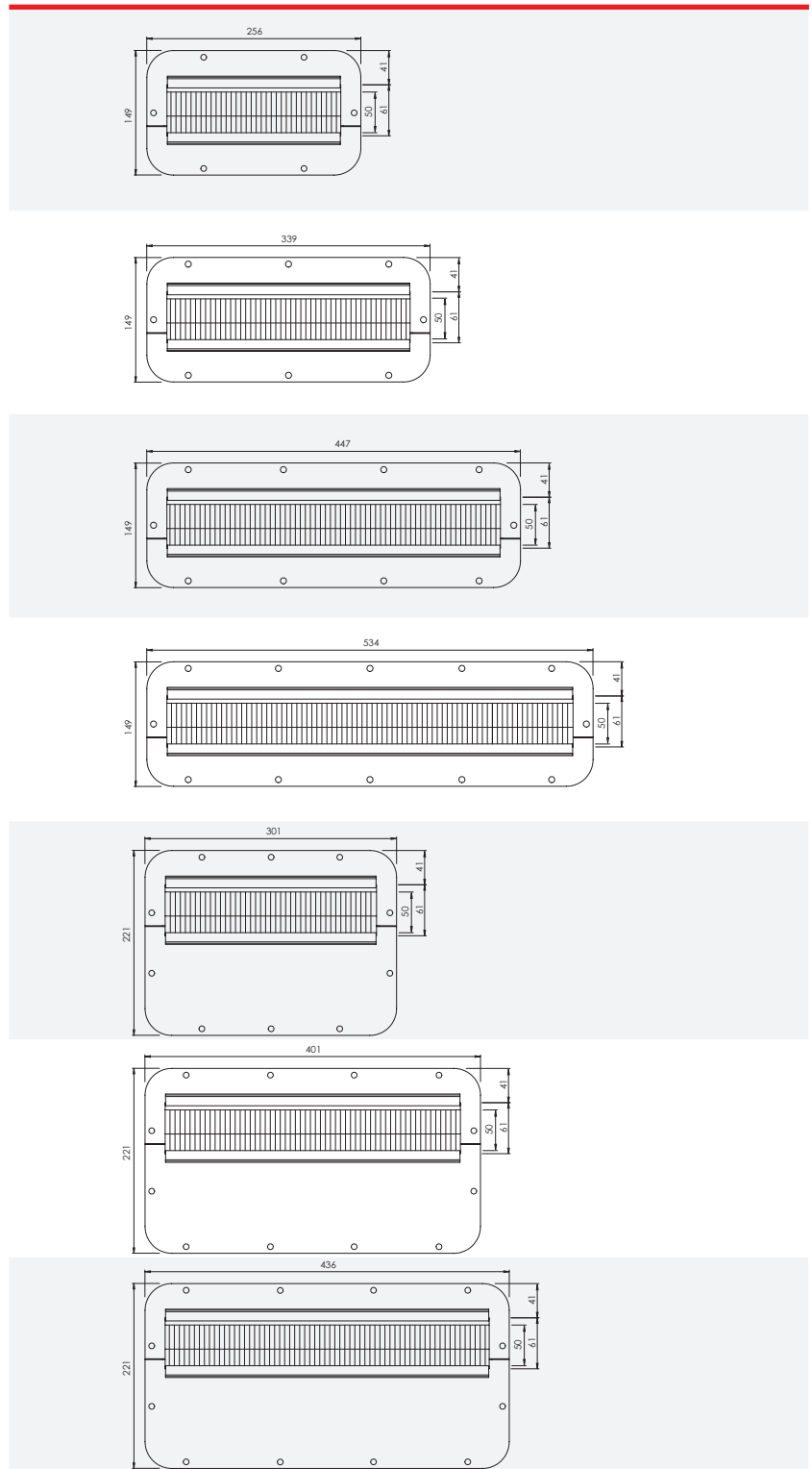
Advantages

- Easy assembly
- Proven brush solution
- The use of two overlapping brush strips arranged in opposite directions increases tightness
- Ready for installation

Specifications

Flange plate	Sheet steel glossy powder-coated, RAL 7035
Brush profile	Aluminium
Brush holder	Metal, galvanised
Bristles	Polyamide (PA)
Temperature	-20°C bis +90°C
Properties	Halogen free, silicone free

Description



i icotek also produces flange plates with brush strips for numerous other enclosure brands. Ask us at pm@icotek.com!



FP-AX-BES-U

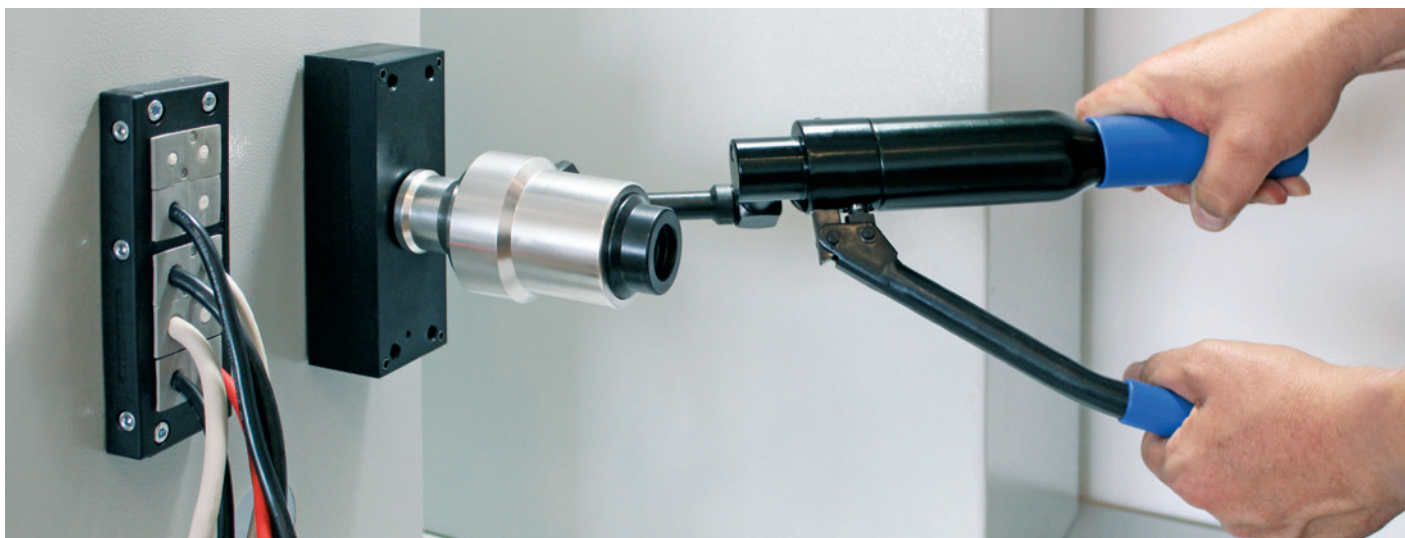
Split flange plates
with brush strips



Type	Size flange plate	suitable for	Order No.
FP-AX-BES-U 256 x 149 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	1	AX 1033.000 AX 1034.000	44100
FP-AX-BES-U 339 x 149 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	2	AX 1031.000 AX 1380.000 AX 1038.000 AX 1077.000 AX 1100.000 AX 1045.000	44101
FP-AX-BES-U 447 x 149 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	3	AX 1050.000 AX 1057.000	44102
FP-AX-BES-U 534 x 149 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000	44103
FP-AX-BES-U 301 x 221 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	5	AX 1338.000 AX 1037.000 AX 1073.000 AX 1055.000 AX 1180.000 AX 1280.000 AX 1181.000 AX 1281.000	44104
FP-AX-BES-U 401 x 221 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	6	AX 1350.000 AX 1130.000 AX 1110.000 AX 1213.000 AX 1114.000 AX 1214.000 AX 1115.000	44105
FP-AX-BES-U 436 x 221 mm, two-part, mounted with KDR-BES-U trim height 35 mm + 50 mm	7	AX 1339.000 AX 1360.000 AX 1376.000 AX 1260.000 AX 1116.000 AX 1059.000 AX 1091.000 AX 1261.000	44106

8 icotek TOOLS

Punch drivers, knockout punches & useful tools



icotek offers a small-sized hand hydraulic punch driver without a hose which allows quick and easy punching of rectangular, square or round holes. When you have to punch several holes, this hand hydraulic punch driver is much faster than manual wrench-style punches.

icotek offers round knockout punches for cut-outs in metric and PG sizes. This self-centering knockout punches split slugs into 2 or 3 pieces for easy slug removal. For installation of pushbuttons and round switches icotek offers a 22.5 mm punch with integrated twist protection notch.

icotek also offers rectangular and square punches and dies, for cut-out sizes of 10-, 16-, and 24- multi-pin industrial connectors as well as for most icotek cable entry systems.



Advantages & benefits

1. Maximum flexibility

Due to its high hydraulic force the compact, lightweight hand hydraulic punch driver makes it easy to punch holes into stainless V2A steel, mild steel, aluminium or plastics. The cylinder of the punch driver rotates 360° on 3 axes. Therefore, maximum flexibility even in hard-to-reach places is provided.

2. Multi-fold slug splitting

The special cutting geometry of the round punches reduces the cutting pressure and therefore the required effort. The punch splits slugs into several pieces for easy slug removal (type related).

3. Perfect for icotek cable entry components

The metric round, rectangular & square knockout punches can be used for industrial standard cut-outs of heavy multi-pin connectors and many icotek cable entry components.



Chapter content



Punch driver sets
Hand hydraulic punch driver
& round knockout die set, metric,
Hydraulic Foot Pump

268



Rectangular & square punches
for cut-outs of heavy multi-pin industrial
connectors and many icotek cable entry
components

269



Round punches
for cut-outs in PG and metric sizes

270 – 271



Rail cutters
for DIN rails and bus bars

DIN-RC 1 / DIN-RC 2

272

KMS

Cable template

The correct size of the KT grommets can easily be determined by using the cable template

- Determining the diameter of the cable using the cable template
- Selecting the KT grommets according to the data on the cable template

Order No. 39800 | PU: 1



QVT-CLICK Tool

Mounting tool

The QVT-CLICK Tool for a quick and easy mounting of the split cable glands QVT-CLICK (see page 73)

Order No. 61435 | PU: 1



Wrenches

for plastic locknuts M75/M85

For mounting the new KEL-DPF sizes we offer suitable wrenches with widths for M75 and M85 plastic locknuts.

Material: aluminium

M75: Order No. 61436 | M85: Order No. 61437 | PU: 1



STFZ I/O Insert Tool

Mounting tool for I/O modules

STFZ I/O Insert Tool for a quick and easy mounting of STFZ terminal clamps (EMC shield clamps for peripheral modules, see page 173).

Order No. 61430 | PU: 1



Punch driver sets

Hand hydraulic punch driver and metric punches, Hydraulic foot pump



Product description

The compact, lightweight hand hydraulic punch driver makes it easy to punch holes into stainless V2A steel, mild steel, aluminium or plastics with a max. sheet thickness of 3 mm (V2A: 2 mm), due to its high hydraulic force. The cylinder of the punch driver rotates 360° on 3 axles, so maximum flexibility even in hard-to-reach places is provided.

The punch driver can be used with all icotek punches and also with punches of other manufacturers.

Advantages & benefits

- Maximum flexibility due to 360° head rotation
- High hydraulic force (60 kN, 600 bar) for easy punching
- Compact, lightweight aluminium design (2 kg)
- Fast and easy operation
- Punch driver also suitable for punches by other manufacturers

Specifications

Material	Aluminium
Punching force	60 kN
Operating pressure	600 bar

Accessories

Round punches	270 – 271
Rectangular & square punches	269

Type	Scope of delivery	Order No.	PU
Punch driver set BASIC	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ϕ 9.5 mm (3/8" UNF) to ϕ 19 mm (3/4" UNF), L: 105 mm 1 draw stud ϕ 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 robust plastic storage case	80000	1
Punch driver set PRO 16-32	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ϕ 9.5 mm (3/8" UNF) to ϕ 19 mm (3/4" UNF), L: 105 mm 1 draw stud ϕ 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 each knockout punch for steel M16 M20 M25 M32 1 robust plastic storage case	80005	1
Punch driver set PRO 16-63	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ϕ 9.5 mm (3/8" UNF) to ϕ 19 mm (3/4" UNF), L: 105 mm 1 draw stud ϕ 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 each knockout punch for steel M16 M20 M25 M32 M40 M50 M63 1 robust plastic storage case	80006	1

Hydraulic foot pump

with hydraulic cylinder and accessories

Universally applicable single-stage foot pump with a fixed operating pressure of 450 bar and built-in pressure relief valve. Suitable for all icotek round punches, rectangular and square punches. Keeps your hands free to position the sheet metal punch precisely, especially when using larger sheet metal punches.

Type	Scope of delivery	Order No.	PU
Hydraulic foot pump	1 foot pump 2,5 m high pressure hose including quick coupling 1 hydraulic cylinder for holding round and rectangular punch 1 draw stud for rectangular punch, Order No. 80209 1 draw stud for round punch (steel) M16 – M25, Order No. 80200 1 multi-step drill, Order No. 80204 1 spacer, Order No. 80202 1 tube lubricant, Order No. 80203 Note: storage case not included in delivery	80002	1

Rectangular & square punches

sized for heavy multi-pin industrial connectors
and icotek cable entry systems



Type	Cut-out size	Max. sheet thickness	For cut-out of connector	With centre punch (number)	Order No.	PU
Punches for steel and aluminium						
Punch 22x45	22 x 45 mm	2 mm	–	–	80059	1
Punch 68x68 **	68 x 68 mm	2 mm	–	–	80064	1
Punch 92x92 **	92 x 92 mm	2 mm	–	–	80060	1
Punch 125x125 * **	125 x 125 mm	2 mm	–	–	80063	1
Punch 66x112 * **	66 x 112 mm	2 mm	–	–	80061	1
Punch E2	24 x 43 mm	2 mm	–	2	80055	1
Punch E3	24 x 65mm	2 mm	–	2	80056	1
Punch E4	24 x 86mm	2 mm	–	2	80057	1
Punch E5	24 x 112mm	2 mm	–	2	80058	1
Punch 6	36 x 52 mm	2 mm	6-pin	4	80062	1
Punch B	46 x 46 mm	2 mm	–	–	80050	1
Punch 10	36 x 65 mm	2 mm	10-pin	2	80051	1
Punch 16	36 x 86 mm	2 mm	16-pin	4	80052	1
Punch 24	36 x 112 mm	2 mm	24-pin	4	80053	1
Punch 24-XL	46 x 112 mm	2 mm	24-pin	4	80054	1
Punches for stainless steel V2A						
Punch 6 for stainless steel V2A	36 x 52 mm	2 mm	6-pin	–	80149	1
Punch B for stainless steel V2A	46 x 46 mm	2 mm	–	–	80150	1
Punch 10 for stainless steel V2A	36 x 65 mm	2 mm	10-pin	4	80151	1
Punch 16 for stainless steel V2A	36 x 86 mm	2 mm	16-pin	4	80152	1
Punch 24 for stainless steel V2A	36 x 112 mm	2 mm	24-pin	4	80153	1
Punch 24-XL for stainless steel V2A	46 x 112 mm	2 mm	24-pin	4	80154	1
Centre punch for rectangular and square punches	–	–	–	–	80065	1

* Storage case not included in delivery

** Only to be used with hydraulic foot pump (order no. 80002).

Product description

Rectangular and square punches and dies make it easy to punch holes into stainless steel (V2A versions), mild steel, aluminium or plastics with a max. sheet thickness of 2 mm. Available for cut-outs sizes of 10-, 16-, and 24- multi-pin heavy industrial connectors and also for numerous special cut-outs. Therefore, the punches are suitable for most icotek cable entry systems. Centre punches are integrated in the die for exact drilling of mounting holes.

The punches are for hydraulic operation only.

Advantages & benefits

- Centre punches for exact drilling of mounting holes
- Robust plastic storage case
- Suitable for hand hydraulic punch driver by icotek and other manufacturers

Specifications

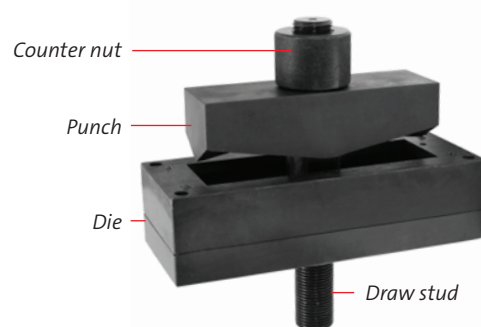
Material Steel, hardened and burnished

Scope of delivery

Punch, die and draw stud, robust plastic storage case

Compatible with

Hydraulic punch driver 268



Round punches

for steel and aluminium,
for cut-outs PG & M16 – M85



3-fold slug splitting



Punch set M16 – M63
Order No. 80007

Product description

Self-centering knockout punches for mild steel, aluminium and plastic walls. Punches available for cut-outs PG 16, M16, M20, M25, M32, M40, M50, M63, M75 and M85. Cut-outs for icotek split cable glands and round cable entry plates can be punched.

The special cutting geometry of the punch reduces the cutting pressure and therefore the required effort. The punch splits slugs into several pieces (type related)* for easy slug removal. For installation of round switches icotek offers a PG 16 punch with an integrated 3 mm twist protection notch.

The punches are designed for manual and hydraulic operation.

Advantages & benefits

- Multiple splitting punches for easier slug removal/ for easy punching
- Suitable with hand hydraulic punch driver by icotek or other manufacturers

Specifications

Material Steel, hardened and burnished

Scope of delivery

Punch and die (without draw stud)

8

Compatible with

Hydraulic punch driver 268

Type	Cut-out diameter	Max. sheet thickness	Thread Ø	Order No.	PU
Punches for steel and aluminium					
Punch set M16 – M63	16.2 – 63.5 mm	M16 – M25: 2.0 mm M32 – M63: 3.0 mm	9.5 mm/19 mm	80007	1
Punch M16	16.2 mm	2 mm	9.5 mm	80020	1
Punch M20	20.4 mm	2 mm	9.5 mm	80021	1
Punch M25	25.4 mm	2 mm	9.5 mm	80022	1
Punch M32	32.5 mm	3 mm	19 mm	80023	1
Punch M40	40.5 mm	3 mm	19 mm	80024	1
Punch M50	50.5 mm	3 mm	19 mm	80025	1
Punch M63	63.5 mm	3 mm	19 mm	80026	1
Punch M75	75.5 mm	2.5 mm	19 mm	80029	1
NEW Punch M80	80 mm	2.5 mm	19 mm	80034	1
Punch M85	86 mm	2 mm	19 mm	80030	1
Punch PG 16	22.5 mm	3 mm	9.5 mm	80027	1
Punch PG 16 with twist protection notch	22.5 mm + 3 mm notch	3 mm	9.5 mm	80028	1
Draw stud	for punches M16 – M25, Ø 9.5 mm to Ø 19 mm, L: 105 mm			80200	1
Draw stud	for punches M32 – M85, Ø 19 mm, L: 125 mm			80201	1
Draw stud	for the use with the hydraulic foot pump Order No. 80002			80213	1
Special nut	for the use with the hydraulic foot pump Order No. 80002			80214	1

*Except punches M75/M85

Note: More PG sizes are available on request.

Round punches

for stainless steel,
for cut-outs PG & M16 – M85



2-fold slug splitting

Type	Cut-out diameter	Max. sheet thickness	Thread Ø	Order No.	PU
Punches for V2A stainless steel					
Punch set M16 – M63 round for stainless steel V2A	16.2 – 63.5 mm	2 mm	11.1 mm/19 mm	80070	1 NEW
Punch M16** for stainless steel V2A	16.2 mm	2 mm	11.1 mm	80120	1
Punch M20** for stainless steel V2A	20.4 mm	2 mm	11.1 mm	80121	1
Punch M25** for stainless steel V2A	25.4 mm	2 mm	11.1 mm	80122	1
Punch M32 for stainless steel V2A	32.5 mm	2 mm	19 mm	80123	1
Punch M40 for stainless steel V2A	40.5 mm	2 mm	19 mm	80124	1
Punch M50 for stainless steel V2A	50.5 mm	2 mm	19 mm	80125	1
Punch M63 for stainless steel V2A	63.5 mm	2 mm	19 mm	80126	1
Punch PG 16 with twist protection notch, for stainless steel V2A	22.5 mm + 3 mm notch	2 mm	9.5 mm	80128	1
Draw stud	with adapter 11.1 x 19.0 mm for V2A punches M16 - M25			80210	1

Product description

Self-centering knockout punches for stainless steel (V2A versions). Punches available for cut-outs PG 16, M16, M20, M25, M32, M40, M50, M63, M75 and M85. Cut-outs for icotek split cable glands and round cable entry plates can be punched.

The special cutting geometry of the punch reduces the cutting pressure and therefore the required effort. The punch splits slugs into two pieces for easy slug removal. For installation of round switches icotek offers a PG 16 punch with an integrated 3 mm twist protection notch.

The punches are designed for manual and hydraulic operation.

Advantages & benefits

- Multiple splitting punches for easier slug removal/for easy punching
- Suitable with hand hydraulic punch driver by icotek or other manufacturers

Specifications

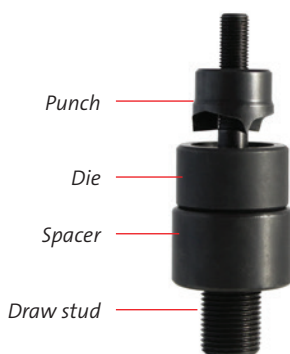
Material Steel, hardened and burnished

Scope of delivery

Punch and die (without draw stud)

Compatible with

Hydraulic punch driver 268



**Draw stud (Order No. 80210) is required.
Note: More PG sizes are available on request.

DIN-RC 1 | DIN-RC 2

Rail cutters

for DIN rails and bus bars



Product description

The DIN-RC 1 and DIN-RC 2 cutters cut various DIN rails and bus bars. The cut is clean and burr-free, there is no waste. The length stop with guiding device ensures that nothing slips during cutting and that the cut is always accurate to size.

DIN-RC 1 is suitable for cutting DIN rails 35 x 7.5 mm and DIN rails 35 x 15 mm.

DIN-RC 2 is suitable for cutting DIN rails 35 x 7.5 mm, DIN rails 35 x 15 mm, DIN rails 15 x 5.5 mm and bus bars 10 x 3 mm.

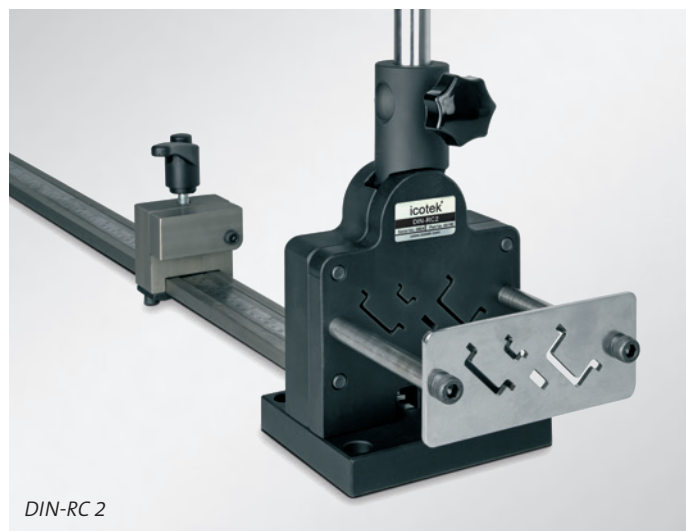
Advantages

- Cuts the most common rails and bars
 - DIN-RC 1: DIN rails 35 x 7.5 mm and 35 x 15 mm
 - DIN-RC 2: DIN rails 35 x 7.5 mm, 35 x 15 mm and 15 x 5.5 mm as well as bus bars 10 x 3 mm
- Exact 90° cuts
- Burr-free cuts
- With length stop 1000 mm and guiding device

Type	Description	Order No.	PU
DIN-RC 1	Rail cutter for DIN rails with length stop 1000 mm	80189	1
DIN-RC 2	Rail cutter for DIN rails and bus bars with length stop 1000 mm	80190	1

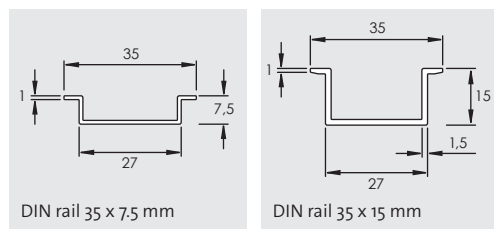


DIN-RC 1

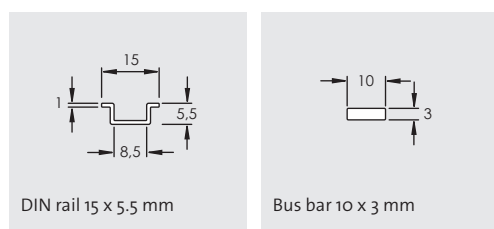


DIN-RC 2

DIN-RC 1:



DIN-RC 2 additionally:



9 Cable entry systems

with IFPS fire penetration seals acc. to EN 45545-3

Fire resistance of fire barriers

The European railway standard for fire safety EN 45545-3 regulates the fire resistance of fire barriers. The requirements and measures defined in this part of the standard aim to protect passengers and staff in railway vehicles against onboard fire incidents.

Fire barriers can have different standards:

The lowest standard „E“

Barrier against flames, preventing fissure formation. „E45“, for example, means that the specimen can withstand the test for 45 minutes.

The highest standard „EI“

Barrier against flames, preventing fissure formation and thermal insulation, which means that the temperature on the side facing away from the fire must not exceed 200° C (180° K above room temperature). „EI30“, for example, means that the specimen can withstand the test for 30 minutes.

Based on the standards EN 45545-3 and EN 1363-1 icotek cable entry systems have been tested on „E“ and „EI“ in vertical alignment using mounted IFPS fire penetration seals. All tested products have been successfully certified using only one layer of fire penetration seals.

icotek cable entry systems meet the classifications E45 and EI30!

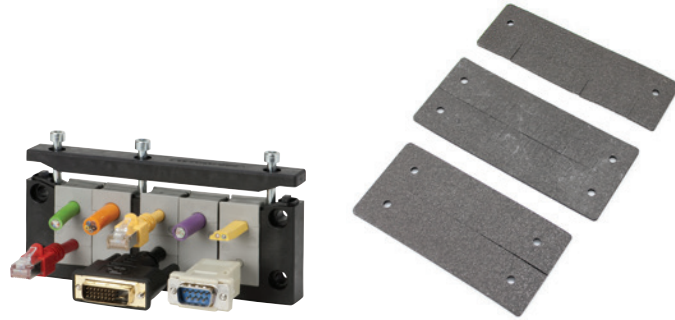


Fire penetration seals facing the fire side:



Cable entry systems

with IFPS fire penetration seals according to EN 45545-3



Product description

icotek cable entry frames and plates with fire penetration seals, approved for use in railway technology (meeting the standards EN 45545-2, EN 45545-3 and EN 1363-1).

The intumescent (foaming) IFPS fire penetration seals which are mounted at the backside of the cable entry components consist of expandable graphite and increase their volume by a multiple in case of a fire.

This creates a barrier which prevents a penetration of flames and high heat from one room into another for the longest possible period.

Advantages & benefits

- Approved for use in railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Easy assembly
- High cable density
- Only one fire penetration seal per cable entry component required
- Large product variety
- Ingress protection up to IP66/UL Type 4X
- High classifications E45/EI30

Specifications

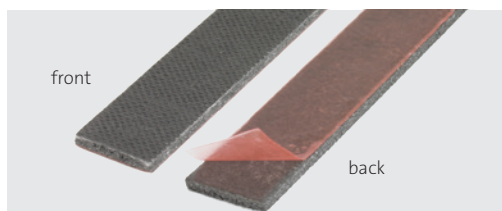
Cable entry comp. See standard products (p. 8 – 109)
 Fire penetration seal Intumescent (foaming)
 Material Graphite (C)

Scope of delivery

Each 1 cable entry frame/plate + suitable fire penetration seal.

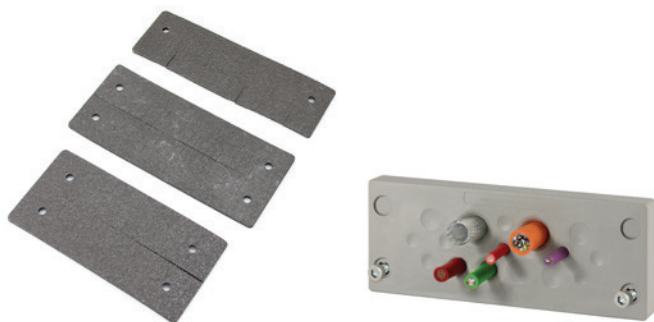
Suitable grommets are not included in the shipment and have to be ordered separately.

Type	Order No.	Order No. with V2A screws	Cut-out	Grommets KT small large	IP Ingress protection	PU
KEL-U 24 4-BS	99300.001	99300.201	36 × 112 mm	2 2	IP54	5
KEL-U 24 7-BS	99300.002	99300.202	36 × 112 mm	6 1	IP54	5
KEL-U 24 10-BS	99300.003	99300.203	36 × 112 mm	10 -	IP54	5
KEL-U 16 2-BS	99301.001	99301.201	36 × 86 mm	- 2	IP54	5
KEL-U 16 5-BS	99301.002	99301.202	36 × 86 mm	4 1	IP54	5
KEL-U 16 8-BS	99301.003	99301.203	36 × 86 mm	8 -	IP54	5
KEL-U 10 6-BS	99306.001	99306.201	36 × 65 mm	6 -	IP54	5
KEL-U 10 3-BS	99306.002	99306.202	36 × 65 mm	2 1	IP54	5
KEL-U-B1-BS	99305.001	99305.201	46 × 46 mm	- 1	IP54	5
KEL-U-B4-BS	99305.002	99305.202	46 × 46 mm	4 -	IP54	5
KEL-ER 24 4-BS	99300.004	99300.204	36 × 112 mm	2 2	IP65 / IP66	5
KEL-ER 24 7-BS	99300.005	99300.205	36 × 112 mm	6 1	IP65 / IP66	5
KEL-ER 24 10-BS	99300.006	99300.206	36 × 112 mm	10 -	IP65 / IP66	5
KEL-ER 16 2-BS	99301.004	99301.204	36 × 86 mm	- 2	IP65 / IP66	5
KEL-ER 16 5-BS	99301.005	99301.205	36 × 86 mm	4 1	IP65 / IP66	5
KEL-ER 16 8-BS	99301.006	99301.206	36 × 86 mm	8 -	IP65 / IP66	5
KEL-ER 10 6-BS	99306.003	99306.203	36 × 65 mm	6 -	IP65 / IP66	5
KEL-ER 10 3-BS	99306.004	99306.204	36 × 65 mm	2 1	IP65 / IP66	5
KEL-ER B1-BS	99305.003	99305.203	46 × 46 mm	- 1	IP65 / IP66	5
KEL-ER B4-BS	99305.004	99305.204	46 × 46 mm	4 -	IP65 / IP66	5
KEL-E5-BS	99302.001	99302.201	24 × 112 mm	5 -	IP54	5
KEL-E4-BS	99309.001	99309.201	24 × 86 mm	4 -	IP54	5
KEL-E3-BS	99308.001	99308.201	24 × 65 mm	3 -	IP54	5
KEL-E2-BS	99307.001	99307.201	24 × 43 mm	2 -	IP54	5
KEL-ER-E5-BS	99302.002	99302.202	24 × 112 mm	5 -	IP65 / IP66	5
KEL-ER-E4-BS	99309.002	99309.202	24 × 86 mm	4 -	IP65 / IP66	5
KEL-ER-E3-BS	99308.002	99308.202	24 × 65 mm	3 -	IP65 / IP66	5
KEL-ER-E2-BS	99307.002	99307.202	24 × 43 mm	2 -	IP65 / IP66	5



Also available: IFPS fire penetration seal stripe, 900 x 17 x 2.7 mm, self-adhesive
Order No. 99303

Cable entry systems with IFPS fire penetration seals according to EN 45545-3



**E45
EI30**

Type	Order No.	Cut-out	IP Ingress protection	PU
KEL-DPU 24 13-BS gy	99300.010	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 14-BS gy	99300.011	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 16-BS gy	99300.012	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 16-1-BS gy	99300.013	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 17-BS gy	99300.014	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 20-BS gy	99300.015	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 21-BS gy	99300.016	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 32-BS gy	99300.017	36 × 112 mm	IP66 / IP68	5
KEL-DPZ 16 11-BS gy	99301.007	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 14-BS gy	99301.008	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 20-BS gy	99301.009	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 25-BS gy	99301.010	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 34-BS gy	99301.011	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 24 14-BS gy	99300.018	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 15-BS gy	99300.019	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 16-BS gy	99300.020	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 17-BS gy	99300.021	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 25-BS gy	99300.022	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 32-BS gy	99300.023	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 42-BS gy	99300.024	36 × 112 mm	IP65 / IP66	5

Fire penetration seal

Type	Order No.	Cut-out	PU
Fire penetration seal size 24	99300	36 × 112 mm	1
Fire penetration seal size 16	99301	36 × 86 mm	1
Fire penetration seal size 10	99306	36 × 65 mm	1
Fire penetration seal size B	99305	46 × 46 mm	1
Fire penetration seal size E5	99302	24 × 112 mm	1
Fire penetration seal size E4	99309	24 × 86 mm	1
Fire penetration seal size E3	99308	24 × 65 mm	1
Fire penetration seal size E2	99307	24 × 43 mm	1
Fire penetration seal size KEL 183 *	99311	180 × 80 mm	1
Fire penetration seal size 24-MT *	99312	82 × 112 mm	1
Fire penetration seal size 16-MT *	99314	82 × 86 mm	1
Fire penetration seal for KEL-DPZ-KX/KL72 *	99315	62 × 192 mm	1

NEW

NEW

NEW

Product description

icotek cable entry frames and plates with fire penetration seals, approved for use in railway technology (meeting the standards EN 45545-2, EN 45545-3 and EN 1363-1).

The intumescent (foaming) IFPS fire penetration seals which are mounted at the backside of the cable entry components consist of expandable graphite and increase their volume by a multiple in case of a fire.

This creates a barrier which prevents a penetration of flames and high heat from one room into another for the longest possible period.

Advantages & benefits

- Approved for use in railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Easy assembly
- High cable density
- Only one fire penetration seal per cable entry component required
- Large product variety
- Ingress protection up to IP66 / UL Type 4X
- High classifications E45 / EI30

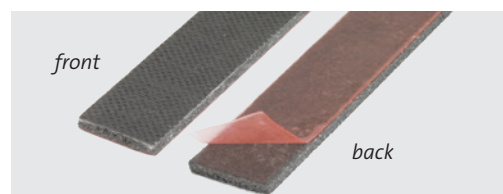
Specifications

Cable entry comp. See standard products (p. 8 – 109)
 Fire penetration seal Intumescent (foaming)
 Material Graphite (C)

Scope of delivery

Each 1 cable entry frame/plate + suitable fire penetration seal.

Suitable grommets are not included in the shipment and have to be ordered separately.



Also available: IFPS fire penetration seal stripe, 900 × 17 × 2.7 mm, self-adhesive
Order No. 99303

* At the time of certification, these sizes were not yet part of our product portfolio.

10 Cable entry systems for the use in cleanrooms

A cleanroom is a room that has an extremely low concentration of air-borne particles. Airborne particles are all particles and substances that are suspended in the air and for the most part cannot be seen with the naked eye.

Such cleanrooms are needed wherever particles present in the ambient air would disrupt production. This is the case, for example, in medical technology, semiconductor production, microsystems technology, pharmaceuticals, aerospace technology or optics. Cleanrooms are also needed in medical research.

Cleanrooms are classified by classes according to ISO 14644-1 as per ISO 1 to 9. The individual cleanroom classes may only contain a certain number of particles of a specified size. The particle concentration is considered per m³ of air. ISO 1 contains the strictest specifications, for ISO 9 the lowest specifications.

All icotek cable entry systems for the cleanroom tested and certified by the Fraunhofer IPA are suitable and certified for class 1 in accordance with ISO 14644-1!



Cleanroom classes according to ISO 14644-1 and other regulations

Regulatory				Limiting values of each air cleanliness class for differing particle sizes and reference volumes (acc. to ISO 14644-1)											
EG-GMP *in operation *	EG-GMP *at rest*	US Fed. Standard 209E*	DIN EN ISO 14644-1	0.1 µm		0.2 µm		0.3 µm		0.5 µm		1.0 µm		5.0 µm	
				per m ³	per cbf	per m ³	per cbf	per m ³	per cbf	per m ³	per cbf	per m ³	per cbf	per m ³	per cbf
			1	10	0,3										
			2	100	3	24	1	10	0,3						
		1	3	1.000	30	237	7	102	3	35	1				
			4	10.000	300	2.370	67	1.020	29	352	9,9	83	2		
		10	5	12.000	340	2.650	75	1.060	29	353	10				
A	A	100	5	100.000	2.833	23.700	671	10.200	289	3.520	100	832	24	29	0,8
										3.520	100			20	0,6
										3.520	100			20	0,6
	B									3.520	100			29	0,8
			6	1.000.000	28.329	237.000	6.710	102.000	2.890	35.200	997	8.320	235	293	8
		1.000								35.300	1.000			247	7
B	C	10.000	7							352.000	9.972	83.200	2.357	2.930	83
										352.000	9.972			2.900	82
										352.000	9.972			2.900	82
										353.000	10.000			2.470	70
C	D	100.000	8							3.520.000	99.716	832.000	23.569	29.300	830
										3.520.000	99.716			29.000	821
										3.520.000	99.716			29.000	821
										3.530.000	100.000			24.700	700
			9							35.200.000	997.167	8.320.000	235.694	293.000	8.300

Source: Fraunhofer IPA



For more information about products for the cleanroom, please contact us directly: pm@icotek.com



Cleaning

icotek recommends cleaning products installed in cleanrooms with a mixture of 70% isopropanol and 30% distilled water.



Specially designed for the cleanroom

Not only the particle emissions are relevant but also the outgassing values VOC (Volatile Organic Compounds)/SVOC (Semivolatile Organic Compounds) of the products used in clean rooms. This applies in particular to the semiconductor, optics and aerospace industries.

In the ISO class, the air cleanliness classification works on the basis of the particulate concentration.

In the ISO-ACC class, air cleanliness works on the basis of chemical concentration. The chemical concentration can lead to a chemical contamination, which can have a damaging effect on the product or on the process.

Materials as well as cable entry systems are classified based on their chemical concentration.

ISO-ACCe Class (x) =
ISO-Air Cleanliness chemical concentration for equipment =
AMC Class Equipment

ISO-ACCm Class (x) =
ISO-Air Cleanliness chemical concentration for material =
AMC Class Material

The Fraunhofer IPA certified values that were in part no longer measurable in the ultra-trace range and thus excellent to very good values. The material-specific emission rate (= ISO-ACCm class) was determined. The smaller the ISO-ACCm class, the lower the material-specific emission rate.

The test certificates of the Fraunhofer IPA can be requested from icotek: pm@icotek.com

Industries and cleanliness criteria

	Particle emission	Outgassing VOC / SVOC	Outgassing anions	Outgassing NH ₃	ESD	Cleanability (Riboflavin test)	Chemical resistance	Biological resistance	Antibacterial activity	H ₂ O ₂ absorption / desorption	Hygienic Design
Semiconductor industry	++	++	+	+	++	+	+	+	0	0	0
Electronic	++	+	+	+	++	0	0	0	0	0	0
Display (e.g. mobile phone)	++	+	0	0	++	0	0	0	0	0	0
Battery technology	++	0	0	0	++	0	0	0	0	0	0
Microsystem technology	++	+	0	0	++	+	+	+	0	0	0
Optic	+	++	+	+	+	+	+	+	0	0	0
Photovoltaic	+	+	0	0	+	0	0	0	0	0	0
Aerospace	++	++	+	+	++	+	+	+	+	0	0
Pharmacy	++	0	0	0	+	++	++	++	++	++	++
Biotechnology	+	+	0	0	0	++	++	++	++	+	++
Medical technology	+	0	0	0	+	++	++	++	++	+	++
Food technology	+	0	0	0	0	++	++	++	++	+	++
Hospital	0	0	0	0	0	++	++	++	++*)	+	++

*)depending on the subject

++ mandatory | + recommended, but not mandatory | 0 generally not required but in individual cases recommended

Source: Fraunhofer IPA



Explanation of article numbers

The products with article ending **.600** are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

The products with the article ending **.601** are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.

Cable entry frames KEL-ER CR series

Split cable entry system for cables with connectors.
Detailed product description from page 8.

Type	Cut-out mm	Grommets KT small large	Order No. *	Order No. **	PU
KEL-ER 24 CR					
KEL-ER 24 10 CR	36/46 × 112	10 –	48241.600	48241.601	5
KEL-ER 24 7 CR	36/46 × 112	6 1	48247.600	48247.601	5
KEL-ER 24 4 CR	36/46 × 112	2 2	48244.600	48244.601	5
KEL-ER 16 CR					
KEL-ER 16 8 CR	36/46 × 86	8 –	48168.600	48168.601	10
KEL-ER 16 5 CR	36/46 × 86	4 1	48165.600	48165.601	10
KEL-ER 16 2 CR	36/46 × 86	– 2	48162.600	48162.601	10
KEL-ER 10 CR					
KEL-ER 10 6 CR	36/46 × 65	6 –	48216.600	48216.601	10
KEL-ER 10 3 CR	36/46 × 65	2 1	48212.600	48212.601	10
KEL-ER-B CR					
KEL-ER-B4 CR	46 × 46	4 –	48204.600	48204.601	10
KEL-ER-B1 CR	46 × 46	– 1	48206.600	48206.601	10
KEL-ER-E CR					
KEL-ER-E5 CR	112 × 24	5 –	48250.600	48250.601	10
KEL-ER-E4 CR	112 × 24	4 –	48259.600	48259.601	10
KEL-ER-E3 CR	65 × 24	3 –	48258.600	48258.601	10
KEL-ER-E2 CR	43 × 24	2 –	48249.600	48249.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Cable entry frames KEL-U CR series

Split cable entry system for cables with connectors.
Detailed product description from page 12.

Type	Cut-out mm	Grommets KT small large	Order No. *	Order No. **	PU
KEL-U 24 CR					
KEL-U 24 10 CR	36/46 × 112	10 –	54241.600	54241.601	5
KEL-U 24 7 CR	36/46 × 112	6 1	54247.600	54247.601	5
KEL-U 24 4 CR	36/46 × 112	2 2	54244.600	54244.601	5
KEL-U 16 CR					
KEL-U 16 8 CR	36/46 × 86	8 –	54168.600	54168.601	10
KEL-U 16 5 CR	36/46 × 86	4 1	54165.600	54165.601	10
KEL-U 16 2 CR	36/46 × 86	– 2	54162.600	54162.601	10
KEL-U 10 CR					
KEL-U 10 6 CR	36/46 × 65	6 –	54216.600	54216.601	10
KEL-U 10 3 CR	36/46 × 65	2 1	54212.600	54212.601	10
KEL-U-B CR					
KEL-U-B4 CR	46 × 46	4 –	54204.600	54204.601	10
KEL-U-B1 CR	46 × 46	– 1	54206.600	54206.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



KT CR

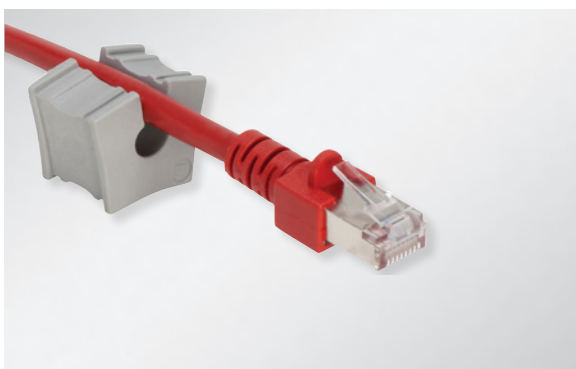
Grommets, small, single

Detailed product description from page 50.

Description	Type	Clamping range	Order No. * grey	Order No. ** grey	PU
BTK	BTK CR	Blank grommet	■ 41251.600	■ 41251.601	10
KT round	KT 1 CR	1 – 2 mm	■ 39941.600	■ 39941.601	10
	KT 2 CR	2 – 3 mm	■ 39934.600	■ 39934.601	10
	KT 3 CR	3 – 4 mm	■ 41203.600	■ 41203.601	10
	KT 4 CR	4 – 5 mm	■ 41204.600	■ 41204.601	10
	KT 5 CR	5 – 6 mm	■ 41205.600	■ 41205.601	10
	KT 6 CR	6 – 7 mm	■ 41206.600	■ 41206.601	10
	KT 7 CR	7 – 8 mm	■ 41207.600	■ 41207.601	10
	KT 8 CR	8 – 9 mm	■ 41208.600	■ 41208.601	10
	KT 9 CR	9 – 10 mm	■ 41209.600	■ 41209.601	10
	KT 10 CR	10 – 11 mm	■ 41210.600	■ 41210.601	10
	KT 11 CR	11 – 12 mm	■ 41211.600	■ 41211.601	10
	KT 12 CR	12 – 13 mm	■ 41212.600	■ 41212.601	10
	KT 13 CR	13 – 14 mm	■ 41213.600	■ 41213.601	10
	KT 14 CR	14 – 15 mm	■ 41214.600	■ 41214.601	10
	KT 15 CR	15 – 16 mm	■ 41215.600	■ 41215.601	10
	KTs 16 CR	16 mm	■ 39901.600	■ 39901.601	10
	KTs 17 CR	17 mm	■ 39900.600	■ 39900.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.





IP54



KT CR Grommets, small, multi

Detailed product description from page 51.

Description	Type	Clamping range	Order No. * grey	Order No. ** grey	PU
KT 2 x	KT 2 1 CR	2× ø 1 mm	■ 39942.600	■ 39942.601	10
	KT 2 2 CR	2× ø 2 mm	■ 39935.600	■ 39935.601	10
	KT 2 3 CR	2× ø 3 mm	■ 39939.600	■ 39939.601	10
	KT 2 4 CR	2× ø 4 mm	■ 39906.600	■ 39906.601	10
	KT 2 5 CR	2× ø 5 mm	■ 41200.600	■ 41200.601	10
	KT 2 6 CR	2× ø 6 mm	■ 41201.600	■ 41201.601	10
	KT 2 7 CR	2× ø 7 mm	■ 41202.600	■ 41202.601	10
	KT 2 8 CR	2× ø 8 mm	■ 39917.600	■ 39917.601	10
KT 4 x	KT 4 2 CR	4× ø 2 mm	■ 39937.600	■ 39937.601	10
	KT 4 3 CR	4× ø 3 mm	■ 39914.600	■ 39914.601	10
	KT 4 4 CR	4× ø 4 mm	■ 39909.600	■ 39909.601	10
	KT 4 5 CR	4× ø 5 mm	■ 39908.600	■ 39908.601	10
	KT 4 6 CR	4× ø 6 mm	■ 39932.600	■ 39932.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



KT CR

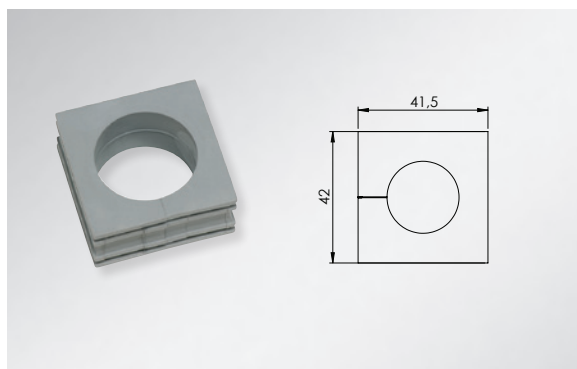
Grommets, large

Detailed product description from page 52.

Description	Type	Clamping range	Order No. * grey	Order No. ** grey	PU
ATG	ATG CR	Adapter grommet	■ 41253.600	■ 41253.601	10
BTG	BTG CR	Blank grommet	■ 41252.600	■ 41252.601	10
KT round	KT 16 CR	16 – 17 mm	■ 41216.600	■ 41216.601	10
	KT 17 CR	17 – 18 mm	■ 41217.600	■ 41217.601	10
	KT 18 CR	18 – 19 mm	■ 41218.600	■ 41218.601	10
	KT 19 CR	19 – 20 mm	■ 41219.600	■ 41219.601	10
	KT 20 CR	20 – 21 mm	■ 41220.600	■ 41220.601	10
	KT 21 CR	21 – 22 mm	■ 41221.600	■ 41221.601	10
	KT 22 CR	22 – 23 mm	■ 41222.600	■ 41222.601	10
	KT 23 CR	23 – 24 mm	■ 41223.600	■ 41223.601	10
	KT 24 CR	24 – 25 mm	■ 41224.600	■ 41224.601	10
	KT 25 CR	25 – 26 mm	■ 41225.600	■ 41225.601	10
	KT 26 CR	26 – 27 mm	■ 41226.600	■ 41226.601	10
	KT 27 CR	27 – 28 mm	■ 41227.600	■ 41227.601	10
	KT 28 CR	28 – 29 mm	■ 41228.600	■ 41228.601	10
	KT 29 CR	29 – 30 mm	■ 41229.600	■ 41229.601	10
	KT 30 CR	30 – 31 mm	■ 41230.600	■ 41230.601	10
	KT 31 CR	31 – 32 mm	■ 41231.600	■ 41231.601	10
KT 32 CR	32 – 33 mm	■ 41232.600	■ 41232.601	10	
KT 33 CR	33 – 34 mm	■ 41233.600	■ 41233.601	10	
KT 34 CR	34 – 35 mm	■ 41234.600	■ 41234.601	10	

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Cable entry plates KEL-DPZ CR series

Detailed product description from page 102.

Type	Cut-out mm	Number of cables	Order No. *	Order No. **	PU
KEL-DPZ 24 CR					
KEL-DPZ 24 14 CR	36 x 112 mm	10× 3.2 - 6.5 mm 4× 16 - 22 mm	■ 43700.600 ■ 50700.600	■ 43700.601 ■ 50700.601	10
KEL-DPZ 24 15 CR	36 x 112 mm	15× 7.2 - 12 mm	■ 43720.600 ■ 50720.600	■ 43720.601 ■ 50720.601	10
KEL-DPZ 24 16 CR	36 x 112 mm	8× 3.2 - 6.5 mm 4× 5 - 9.7 mm 2× 9 - 16.2 mm 2× 16 - 22 mm	■ 43725.600 ■ 50725.600	■ 43725.601 ■ 50725.601	10
KEL-DPZ 24 17 CR	36 x 112 mm	6× 3.2 - 6.5 mm 6× 5 - 10.2 mm 5× 9 - 16.2 mm	■ 43705.600 ■ 50705.600	■ 43705.601 ■ 50705.601	10
KEL-DPZ 24 25 CR	36 x 112 mm	12× 3.2 - 6.5 mm 7× 4.8 - 9.7 mm 6× 7.5 - 12 mm	■ 43710.600 ■ 50710.600	■ 43710.601 ■ 50710.601	10
KEL-DPZ 24 26 CR	36 x 112 mm	26× 5.0 - 10.2 mm	■ 43711.600 ■ 50711.600	■ 43711.601 ■ 50711.601	10
KEL-DPZ 24 32 CR	36 x 112 mm	21× 3.2 - 6.5 mm 8× 5 - 10.2 mm 3× 7.5 - 12 mm	■ 43730.600 ■ 50730.600	■ 43730.601 ■ 50730.601	10
KEL-DPZ 24 42 CR	36 x 112 mm	42× 3.2 - 6.5 mm	■ 43715.600 ■ 50715.600	■ 43715.601 ■ 50715.601	10
KEL-DPZ 24 121 CR	36 x 112 mm	119× 1.5 - 2.6 mm 2× 2.5 - 5 mm	■ 43735.600 ■ 50735.600	■ 43735.601 ■ 50735.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Cable entry plates KEL-DPZ CR series

Detailed product description from page 102.

Type	Cut-out mm	Number of cables	Order No. *	Order No. **	PU
KEL-DPZ 16 CR					
KEL-DPZ 16 11 CR	36 x 86 mm	11 x 7.5 - 12 mm	43815.600	43815.601	10
KEL-DPZ 16 14 CR	36 x 86 mm	5 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 9 - 16.2 mm	43816.600	43816.601	10
KEL-DPZ 16 20 CR	36 x 86 mm	11 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 7.5 - 12 mm	43817.600	43817.601	10
KEL-DPZ 16 25 CR	36 x 86 mm	16 x 3.2 - 6.5 mm 6 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43818.600	43818.601	10
KEL-DPZ 16 34 CR	36 x 86 mm	34 x 3.2 - 6.5 mm	43819.600	43819.601	10
KEL-DPZ 6 CR					
KEL-DPZ 6 12 CR	52 x 36 mm	12 x 4.5 - 8.0 mm	43809.600	43809.601	10
KEL-DPZ 6 18-1 CR	52 x 36 mm	6 x 2.5 - 5.0 mm 5 x 3.2 - 6.5 mm 7 x 4.5 - 8.0 mm	43811.600	43811.601	10
KEL-DPZ 6 18 CR	52 x 36 mm	18 x 3.2 - 6.5 mm	43812.600	43812.601	10
KEL-DPZ 6 23 CR	52 x 36 mm	13 x 2.5 - 5.0 mm 10 x 3.2 - 6.5 mm	43813.600	43813.601	10
KEL-DPZ 6 27 CR	52 x 36 mm	27 x 2.5 - 5.0 mm	43814.600	43814.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Cable entry plates KEL-DPZ CR series

Detailed product description from page 102.

Type	Cut-out mm	Number of cables	Order No. *	Order No. **	PU
KEL-DPZ-B CR					
KEL-DPZ-B 13 CR	46 x 46 mm	8× 3.2 - 6.5 mm 4× 5 - 10.2 mm 1× 16 - 22 mm	■ 43794.600 ■ 50794.600	■ 43794.601 ■ 50794.601	10
KEL-DPZ-B 17 CR	46 x 46 mm	10× 3.2 - 6.5 mm 4× 5 - 10.2 mm 2× 7.5 - 12 mm 1× 9 - 16.2 mm	■ 43796.600 ■ 50796.600	■ 43796.601 ■ 50796.601	10
KEL-DPZ-B 25 CR	46 x 46 mm	25× 3.2 - 6.5 mm	■ 43798.600 ■ 50798.600	■ 43798.601 ■ 50798.601	10
KEL-DPZ-E CR					
KEL-DPZ-E 112 7 CR	18 x 112 mm	7× 7.5 - 12 mm	■ 43780.600 ■ 50780.600	■ 43780.601 ■ 50780.601	10
KEL-DPZ-E 112 21 CR	18 x 112 mm	21× 3.2 - 6.5 mm	■ 43790.600 ■ 50790.600	■ 43790.601 ■ 50790.601	10
KEL-DPZ-KX/KL CR					
KEL-DPZ-KX/KL 72 CR	62 x 192 mm	42× 3.2 - 6.5 mm 21× 5 - 10.2 mm 6× 9 - 16.2 mm 3× 16 - 22 mm	■ 43675.001.600 ■ 43675.101.600	■ 43675.001.601 ■ 43675.101.601	1

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



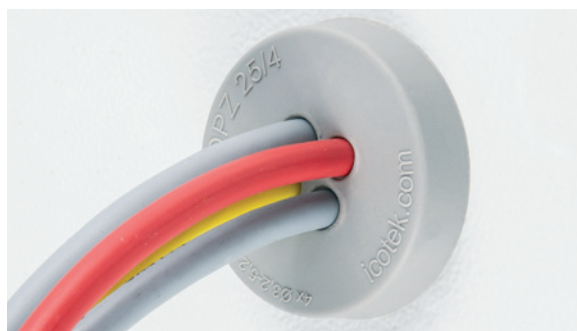
Cable entry plates KEL-DPZ round CR series

Detailed product description from page 110.

Type	Number of cables	Thread metric	Thread length	External diameter	Mounting height	Order No. *	Order No. **	PU
KEL-DPZ 25 3 CR	2× 3.2 - 5.2 mm 1× 3.2 - 6.5 mm	M25 × 1.5	14 mm	39 mm	8 mm	■ 43736.600 ■ 50736.600	■ 43736.601 ■ 50736.601	10
KEL-DPZ 25 4 CR	4× 3.2 - 5.2 mm	M25 × 1.5	14 mm	39 mm	8 mm	■ 43737.600 ■ 50737.600	■ 43737.601 ■ 50737.601	10
KEL-DPZ 32 4 CR	3× 3.2 - 6.5 mm 1× 7.2 - 12.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	■ 43732.600 ■ 50732.600	■ 43732.601 ■ 50732.601	10
KEL-DPZ 32 4-2 CR	4× 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	■ 43733.600 ■ 50733.600	■ 43733.601 ■ 50733.601	10
KEL-DPZ 32 7 CR	7× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	■ 43734.600 ■ 50734.600	■ 43734.601 ■ 50734.601	10
KEL-DPZ 40 8 CR	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm	M40 × 1.5	14 mm	52 mm	8 mm	■ 43741.600 ■ 50741.600	■ 43741.601 ■ 50741.601	10
KEL-DPZ 50 8 CR	5× 5 - 10.2 mm 3× 7.2 - 12.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	■ 43750.600 ■ 50750.600	■ 43750.601 ■ 50750.601	10
KEL-DPZ 50 10 CR	7× 3.2 - 6.5 mm 2× 5 - 10.2 mm 1× 16 - 22.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	■ 43751.600 ■ 50751.600	■ 43751.601 ■ 50751.601	10
KEL-DPZ 50 12 CR	4× 3.2 - 6.5 mm 8× 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	■ 43752.600 ■ 50752.600	■ 43752.601 ■ 50752.601	10
KEL-DPZ 50 19 CR	19× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	■ 43758.600 ■ 50758.600	■ 43758.601 ■ 50758.601	10
KEL-DPZ 50 78 CR	76× 1.5 - 2.6 mm 2× 2.5 - 5 mm	M50 × 1.5	14 mm	62 mm	8 mm	■ 43756.600 ■ 50756.600	■ 43756.601 ■ 50756.601	10
KEL-DPZ 63 9 CR	1× 3.2 - 6.5 mm 3× 5 - 10.2 mm 4× 9 - 16.2 mm 1× 16 - 22.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	■ 43760.600 ■ 50760.600	■ 43760.601 ■ 50760.601	10
KEL-DPZ 63 13 CR	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm 5× 9 - 16.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	■ 43761.600 ■ 50761.600	■ 43761.601 ■ 50761.601	10
KEL-DPZ 63 14 CR	14× 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	■ 43762.600 ■ 50762.600	■ 43762.601 ■ 50762.601	10
KEL-DPZ 63 35 CR	35× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	■ 43763.600 ■ 50763.600	■ 43763.601 ■ 50763.601	10

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Cable entry plates

KEL-DPZ-HD CR

Hygienic Design Line

Detailed product description from page 130.

Type	Number of cables	Thread metric	Thread length	External diameter	Mounting height	Order No. *	Order No. **	PU
KEL-DPZ-HD 32 4 CR	3× 3.2 - 6.5 mm 1× 7.2 - 12.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	70351.600	70351.601	5
KEL-DPZ-HD 32 4-2 CR	4× 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	70352.600	70352.601	5
KEL-DPZ-HD 32 7 CR	7× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	70353.600	70353.601	5
KEL-DPZ-HD 40 8 CR	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm	M40 × 1.5	14 mm	52 mm	8 mm	70354.600	70354.601	5
KEL-DPZ-HD 50 8 CR	5× 5 - 10.2 mm 3× 7.2 - 12.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	70355.600	70355.601	5
KEL-DPZ-HD 50 10 CR	7× 3.2 - 6.5 mm 2× 5 - 10.2 mm 1× 16 - 22.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	70356.600	70356.601	5
KEL-DPZ-HD 50 12 CR	4× 3.2 - 6.5 mm 8× 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	70357.600	70357.601	5
KEL-DPZ-HD 50 19 CR	19× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	70358.600	70358.601	5
KEL-DPZ-HD 63 9 CR	1× 3.2 - 6.5 mm 3× 5 - 10.2 mm 4× 9 - 16.2 mm 1× 16 - 22.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	70359.600	70359.601	5
KEL-DPZ-HD 63 13 CR	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm 5× 9 - 16.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	70360.600	70360.601	5
KEL-DPZ-HD 63 14 CR	14× 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	70361.600	70361.601	5
KEL-DPZ-HD 63 35 CR	35× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	70362.600	70362.601	5

* The products with article ending .600 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1. The materials used for these products have been tested and certified for outgassing according to VOC/SVOC (ISO 14644-8; ISO 16000-6,-9,-11,-25, VDI 2083 sheet 17).

** The products with the article ending .601 are tested and certified for particle emission for cleanroom class 1 according to ISO 14644-1.



Appendix

Certificates



Product	IP rating						UL 50E rating		cURus	RINA	DNV-GL	EN45545-2	UV	ECOLAB certified	RoHS compliant	Cleanroom	Flame class UL94		Halogen free
	IP54	IP64	IP65	IP66	IP67	IP68	12	4X									GL	HL3	
Product group 1																			
KEL 24/16/10/-B	■						■		■	■	■	■	■	■	■		■	■	
KEL 24-E/-MT/-2MT	■								■	■	■	■	■	■	■		■	■	
KEL 16-E/-MT/-2MT	■								■	■	■	■	■	■	■		■	■	
KEL-ER 24/16/10/-B	■	■	■	■			■	■	■	■	■	■	■	■	■		■	■	
KEL-U 24/16/10/-B	■						■		■	■	■	■	■	■	■		■	■	
KEL-E	■						■		■	■	■	■	■	■	■		■	■	
KEL-ER-E	■	■	■	■			■	■	■	■	■	■	■	■	■		■	■	
KEL-FG-A / -B	■						■	■	■	■	■	■	■	■	■		■	■	
KEL-FG-E	■						■	■	■	■	■	■	■	■	■		■	■	
KEL-SNAP	■						■		■	■	■	■	■	■	■		■	■	
KVT-ER	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	
KVT gy	■						■		■	■	■	■	■	■	■		■	■	
KVT bk	■						■		■	■	■	■	■	■	■		■	■	
KVT 80 gy	■						■		■	■	■	■	■	■	■		■	■	
KVT 80 bk	■						■		■	■	■	■	■	■	■		■	■	
KVT-SNAP	■						■		■	■	■	■	■	■	■		■	■	
KVT-W90 gy	■						■		■	■	■	■	■	■	■		■	■	
KVT-W90 bk	■						■		■	■	■	■	■	■	■		■	■	
KT small gy, single	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	
KT small bk, single	■	■	■	■	■	■			■	■	■	■	■	■	■		■	■	
KT small gy, multi	■						■		■	■	■	■	■	■	■		■	■	
KT small bk, multi	■								■	■	■	■	■	■	■		■	■	
KT large gy	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	
KT large bk	■	■	■	■	■	■			■	■	■	■	■	■	■		■	■	
KTMB small/ large	■						■		■	■	■	■	■	■	■		■	■	
KT-DPF small gy	■						■		■	■	■	■	■	■	■		■	■	
KT-DPF small bk	■								■	■	■	■	■	■	■		■	■	
KT-DPF large gy	■						■		■	■	■	■	■	■	■		■	■	
KT-DPF large bk	■								■	■	■	■	■	■	■		■	■	
DT	■						■		■	■	■	■	■	■	■		■	■	
ST							■		■	■	■	■	■	■	■		■	■	
KEL-FL	■								■	■	■	■	■	■	■		■	■	
FT	■								■	■	■	■	■	■	■		■	■	
KEL 183	■						■		■	■	■	■	■	■	■		■	■	
KEL 183-E	■								■	■	■	■	■	■	■		■	■	
KTMB 183	■						■		■	■	■	■	■	■	■		■	■	
KEL-JUMBO 1 & 2	■								■	■	■	■	■	■	■		■	■	
KTF	■						■		■	■	■	■	■	■	■		■	■	
KEL-QUICK 24/16/10/-B/-E	■						■		■	■	■	■	■	■	■		■	■	
QVT	■								■	■	■	■	■	■	■		■	■	
QVT-CLICK	■								■	■	■	■	■	■	■		■	■	
KEL-QTA 24/10/-B/round	■								■	■	■	■	■	■	■		■	■	
KEL-QTE	■								■	■	■	■	■	■	■		■	■	
QT	■								■	■	■	■	■	■	■		■	■	
Product group 2																			
KEL-DPU 24 gy	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	
KEL-DPU 24 bk	■	■	■	■	■	■			■	■	■	■	■	■	■		■	■	
KEL-DPU-HD	■	■	■	■	■	■			■	■	■	■	■	■	■		■	■	
KEL-DPZ 24 gy	■	■	■	■			■		■	■	■	■	■	■	■		■	■	
KEL-DPZ 24 bk	■	■	■	■					■	■	■	■	■	■	■		■	■	
KEL-DPZ 16 / 6	■	■	■	■					■	■	■	■	■	■	■		■	■	
KEL-DPZ-B gy	■	■	■	■			■		■	■	■	■	■	■	■		■	■	



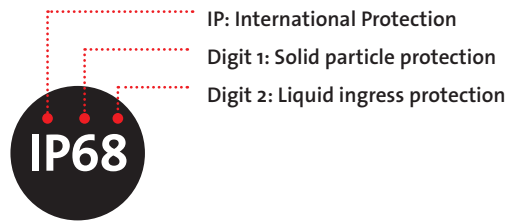
Appendix Certificates



Product	IP rating						UL 50E rating		cURus	RINA	DNV-GL	EN45545-2 HL3	UV	ECOLAB certified	RoHS compliant	Cleanroom EN ISO 16644	Flame class UL94		Halogen free Silicone free
	IP54	IP64	IP65	IP66	IP67	IP68	12	4X									HB	VO	
KEL-DPZ-B bk	■	■	■	■			■	■	■	■		■	■	■			■	■	
KEL-DPZ-E gy	■	■	■	■			■	■	■	■		■	■	■			■	■	
KEL-DPZ-E bk	■	■	■	■			■	■	■	■		■	■	■			■	■	
KEL-DPZ-KL gy	■	■	■				■	■	■	■		■	■	■			■	■	
KEL-DPZ-KL bk	■	■	■				■	■	■	■		■	■	■			■	■	
KEL-DPZ round gy	■	■	■	■	■	■	■	■	■	■		■	■	■			■	■	
KEL-DPZ round bk	■	■	■	■	■	■	■	■	■	■		■	■	■			■	■	
KEL-DPZ-CLICK	■	■	■	■	■	■		■	■	■		■	■	■			■	■	
KEL-DPZ-HD	■	■	■	■	■	■	■	■	■				■	■			■	■	
KEL-DP 24 gy	■	■					■	■	■	■		■	■	■			■	■	
KEL-DP 16 / 6	■	■					■	■	■	■		■	■	■			■	■	
KEL-DP 24 bk	■	■					■	■	■	■		■	■	■			■	■	
KEL-DP-E gy	■	■					■	■	■	■		■	■	■			■	■	
KEL-DP-E bk	■	■					■	■	■	■		■	■	■			■	■	
KEL-DP round gy	■	■	■				■	■	■	■		■	■	■			■	■	
KEL-DP round bk	■	■	■				■	■	■	■		■	■	■			■	■	
ST-B							■	■							■		■	■	
KEL-SCDP KEL-SCDP-RW	■	■	■								- ■	■	■	■			■	■	
KEL-DPF gy	■	■	■	■		■	■	■	■			■	■	■			■	■	
KEL-DPF bk	■	■	■	■		■	■	■	■			■	■	■			■	■	
KEL-JUMBO flex	■						■	■				■	■	■			■	■	
KEL-ULTRA flex	■	■	■	■			■	■	■			■	■	■			■	■	
Product group 3																			
KZL									■	■	■	■	■	■			■	■	
SF ZL									■	■	■	■	■	■			■	■	
ZL									■	■	■	■	■	■			■	■	
ZL-AB									■	■	■	■	■	■			■	■	
ZL 03 04 05									■	■	■	■	■	■			■	■	
Product group 4																			
EMC-KEL-DS	■								■						■		■	■	
EMC-KVT-DS	■								■						■		■	■	
Product group 5																			
CONFIX FWS-A/-B gy	■														■		■	■	
CONFIX FWS-A/-B bk	■														■		■	■	
Product group 6																			
KDR-ESR / KDRS-ESR	■										■				■		■	■	
KDR2 / KDR-BMP / MP	■														■		■	■	
BPK	■	■					■	■							■		■	■	
BPK-RF	■						■	■							■		■	■	
BPM	■	■	■												■		■	■	
BPK-SNAP	■														■	■	■	■	
KGM								■							■		■	■	
KBH-S/KBH-R											■	■							
Product group 7																			
KEL-BES(-S) 24/16/10/round															■		■	■	
Product group 10																			
KEL-ER CR	■	■	■	■			■	■	■	■		■	■	■	■	■	■	■	
KEL-U CR	■						■	■	■	■		■	■	■	■	■	■	■	
KEL-DPZ CR gy/bk	■	■	■	■			■	■	■	■	■ -	■	■	■	■	■	■	■	
KEL-DPZ round CR gy/bk	■	■	■	■	■	■	■	■	■	■	■ -	■	■	■	■	■	■	■	
KEL-DPZ-HD CR	■	■	■	■	■	■		■						■	■	■	■	■	

Appendix

IP protection classes



IP protection classes according to EN 60529

1st digit	Solid particle protection...		2nd digit	Liquid ingress protection...	
0		no protection	0		no protection
1		against any surface of the body > 50 mm	1		against dripping water (vertically falling drops)
2		against any surface of the body > 12.5 mm	2		against dripping water when tilted at 15°
3		against objects > 2.5 mm (tools)	3		against spraying water at any angle up to 60°
4		against objects > 1 mm (most wires)	4		against splashing water from any direction
5		Dust protected	5		against water jets from any direction
6		Dust tight	6		against powerful water jets from any direction by a nozzle
			7		Suitable for temporary immersion in water up to 1 m depth
			8		Suitable for continuous immersion in water*

Appendix

UL type rating vs. NEMA rating

Why you should only rely on the UL Type Rating according to UL 50E



UL type rating acc. to UL 50E

The UL type rating is required for enclosures, cable entry components etc. for which an UL approval is required – regardless of the installation location. The UL type rating according to UL 50E requires intensive testing!

If a customer has to deliver a device according to UL Type 4X to the U.S. and installs a cable entry component, the manufacturer of which only specifies as NEMA 4X, this can lead to big problems. The UL inspector who approves the device usually also requests the corresponding test certificate from the UL. If this cannot be shown, the component has to be removed because the device does not meet the requirements of UL 50E.

All icotek products with a type rating have been tested and certified by UL according to UL 50E!



NEMA types

Using the NEMA rating lies with the responsibility of the manufacturer. That means: For enclosures, cable entry components etc. that are not particularly used for the North American market and for which no UL approval is required, the NEMA rating is sufficient.

It is also the sole responsibility of the manufacturer whether he checks the component on tightness at all or whether he just claims a NEMA conformity. An examination is not absolutely necessary. Regardless of whether the product is delivered to the USA or not, proof that the product corresponds to the tightness specified by the manufacturer is ensured by the type test according to UL 50E.

Appendix

Flammability classification according to UL 94

Flame class UL94 HB

Applying the horizontal burning test the material burns slowly. For parts with a thickness up to 3 mm the burning speed must not be faster than 3 inches/min and for parts with a thickness over 3 mm the burning speed must not be faster than 1,5 inches/mm.

Materials which burn faster are not UL certified.



Flame class UL 94 V-2

Applying the vertical burning test, the material must normally extinguish itself after 25 seconds or less, but max. after 30 seconds. The material may drop and cotton wool placed under the probe may inflame. The material must not glow longer than 60 seconds.

Flame class UL 94 V-1

Applying the vertical burning test, the material must normally extinguish itself after 25 seconds or less, but max. after 30 seconds. The material may drop and cotton wool placed under the probe may inflame. The material must not glow longer than 30 seconds.

Flame class UL 94 V-0

Applying the vertical burning test, the material must normally extinguish itself after 5 seconds or less, but max. after 10 seconds. The material may drop down, but cotton wool placed under the probe must not inflame. The material must not glow longer than 30 seconds.

General reference notes



We provide all the information on chemical and physical properties of our products and technical advice to the best of our knowledge.

Please do your own examinations and tests to determine the practical suitability of the products for the usage intended.

Application, use and installation of the products is the customer's responsibility. Legal and regulatory provisions and any rights to third parties have to be observed.

Moreover our general terms and conditions, which can be requested from us, apply.

This catalogue was prepared with the greatest care. All technical data and information have been reviewed before printing. Due to continuous improvement and development of our production programme we reserve, modify products from this catalogue or to take out products from our product range. Therefore, technical information and products which are included in this catalogue may differ – without prior notice.

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Appendix

Reference list

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31100	250	31590	213	32297	146	32803	193	36235	164	36484	190	37618	163	39916	51
31105	250	31592	213	32351	149	32804	193	36236	164	36486	190	37620	162	39917	51
31110	250	31594	213	32352	149	32805	193	36237	165	36488	190	37622	162	39918	51
31120	250	31596	213	32353	149	32806	194	36238	165	36490	190	37630	164	39921	51
31130	250	31598	213	32354	149	32807	194	36243	163	36500	162	37632	164	39922	51
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31200	214	31602	213	32356	149	32809	194	36245	163	36504	163	37642	172	39924	51
31210	214	31604	213	32357	149	32810	194	36246	163	36506	163	37650	172	39929	51
31215	214	31606	213	32358	149	32811	194	36247	163	36520	188	37652	172	39930	51
31220	214	31610	213	32360	146	32815	194	36248	163	36522	188	37680	171	39931	51
31230	214	31612	213	32361	146	32823	194	36249	163	36524	188	37681	171	39932	51
31235	214	31614	213	32362	146	32824	194	36250	163	36525	186	37682	171	39933	51
31240	214	31616	213	32363	146	32825	194	36251	161	36526	188	37683	171	39934	50
31250	214	31618	213	32364	146	32847	194	36252	163	36527	186	37684	171	39935	51
31260	214	31620	213	32365	146	32848	194	36253	161	36530	190	37685	171	39936	51
31300	215	31622	213	32366	146	32849	194	36255	161	36540	190	37687	171	39937	51
31310	215	31624	213	32367	146	32850	194	36256	161	36550	190	37688	171	39938	51
31315	215	31626	213	32695	192	32868	194	36257	161	36562	190	38005	183	39939	51
31320	215	32000	144	32700	192	32870	194	36258	161	36611	165	38010	183	39940	51
31330	215	32001	144	32701	192	32872	194	36259	161	36612	165	38015	183	39941	50
31335	215	32002	144	32702	192	32873	193	36282	165	36696	168	38020	183	39942	51
31340	215	32003	144	32703	192	32878	192	36283	165	36700	168	38025	183	39943	50
31350	215	32004	144	32704	192	36000	249	36284	165	36704	169	38030	183	39944	51
31360	215	32005	144	32705	192	36002	249	36285	165	36708	169	38035	183	39946	64
31380	210	32006	144	32706	192	36008	249	36286	165	36810	163	38040	183	39947	64
31381	210	32007	144	32707	192	36010	249	36287	165	36815	163	38045	183	39948	64
31383	210	32112	147	32709	192	36016	249	36322	191	36820	163	38050	183	39949	64
31384	210	32114	147	32730	192	36018	249	36324	191	36850	162	38105	184	39950	64
31386	210	32116	147	32731	192	36024	249	36326	191	36855	162	38110	184	39952	62
31387	210	32222	145	32732	192	36026	249	36328	191	36860	162	38115	184	39953	63
31389	210	32224	145	32733	192	36032	249	36330	191	36865	162	38120	184	39954	63
31390	210	32226	145	32734	192	36034	249	36332	191	36870	162	38125	184	39955	63
31392	210	32228	145	32735	192	36040	249	36400	190	36875	162	38130	184	39956	63
31393	210	32230	145	32736	192	36042	249	36412	190	36880	162	38135	184	39957	63
31395	210	32232	145	32737	192	36048	249	36414	190	36885	162	38140	184	39961	61
31396	210	32234	145	32738	192	36050	249	36416	190	36910	160	38145	184	39962	63
31410	211	32236	145	32739	192	36056	249	36418	190	36915	160	38150	184	39963	63
31411	211	32250	148	32741	192	36058	249	36422	190	36920	160	39110	188	39964	63
31413	211	32251	147	32742	192	36064	249	36424	190	36925	160	39150	187	39965	60
31414	211	32252	147	32743	192	36066	249	36426	190	36930	160	39160	187	39966	63
31416	211	32260	148	32744	192	36072	249	36428	190	36935	160	39170	187	39967	66
31417	211	32262	148	32746	192	36074	249	36430	190	36940	160	39180	187	39968	66
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31420	211	32270	146	32759	193	36200	157	36434	190	36952	185	39183	187	39970	66
31422	211	32271	146	32760	193	36202	157	36436	190	36953	185	39184	187	39971	66
31423	211	32272	146	32761	193	36204	157	36438	190	36954	185	39190	187	39972	66
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31426	211	32274	146	32763	193	36206	157	36442	190	36958	185	39192	219	41201	51
31550	212	32275	146	32764	193	36207	157	36444	190	36962	185	39710	192	41202	51
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31554	212	32277	146	32766	193	36209	157	36448	190	36965	185	39900	50	41204	50
31556	212	32280	146	32767	193	36213	157	36450	190	36984	185	39901	50	41205	50
31558	212	32281	146	32768	193	36216	157	36452	190	36985	185	39902	51	41206	50
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41231	52	41485	53	42209	21	42513	80	42806	123	43314	235	43554	122	43760	111
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41251	50	41530	54	42222	22	42517	81	42822	123	43322	235	43561	122	43780	109
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43940	101	45030	45	46202	29	50567	122	52275	250	70622	132	80200	270	99478	205
43942	101	45031	45	46203	29	50568	122	52276	250	70623	132	80201	270	99479	205
43944	101	45034	44	46204	29	50569	122	52277	250	70624	132	80210	271	99480	205
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44051	113	45036	44	46211	29	50576	119	52283	250	70681	133	80214	270	99482	205
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44053	113	45105	250	46214	29	50581	119	52285	45/224	70683	133	88002	181	99484	205
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44101	265	45204	45	47255	26	50705	103	54241	13	80006	268	99216	144	99555	201
44102	265	45205	45	48162	9	50710	103	54244	13	80007	270	99217	144	99556	201
44103	265	45206	45	48165	9	50711	103	54247	13	80020	270	99218	144	99557	201
44104	265	45212	45	48168	9	50715	104	58000	263	80021	270	99219	144	99558	201
44105	265	45215	45	48204	10	50720	103	58006	263	80022	270	99300	275	992415	144
44106	265	45236	46	48206	10	50725	103	58012	263	80023	270	99301	239	32695.01	159
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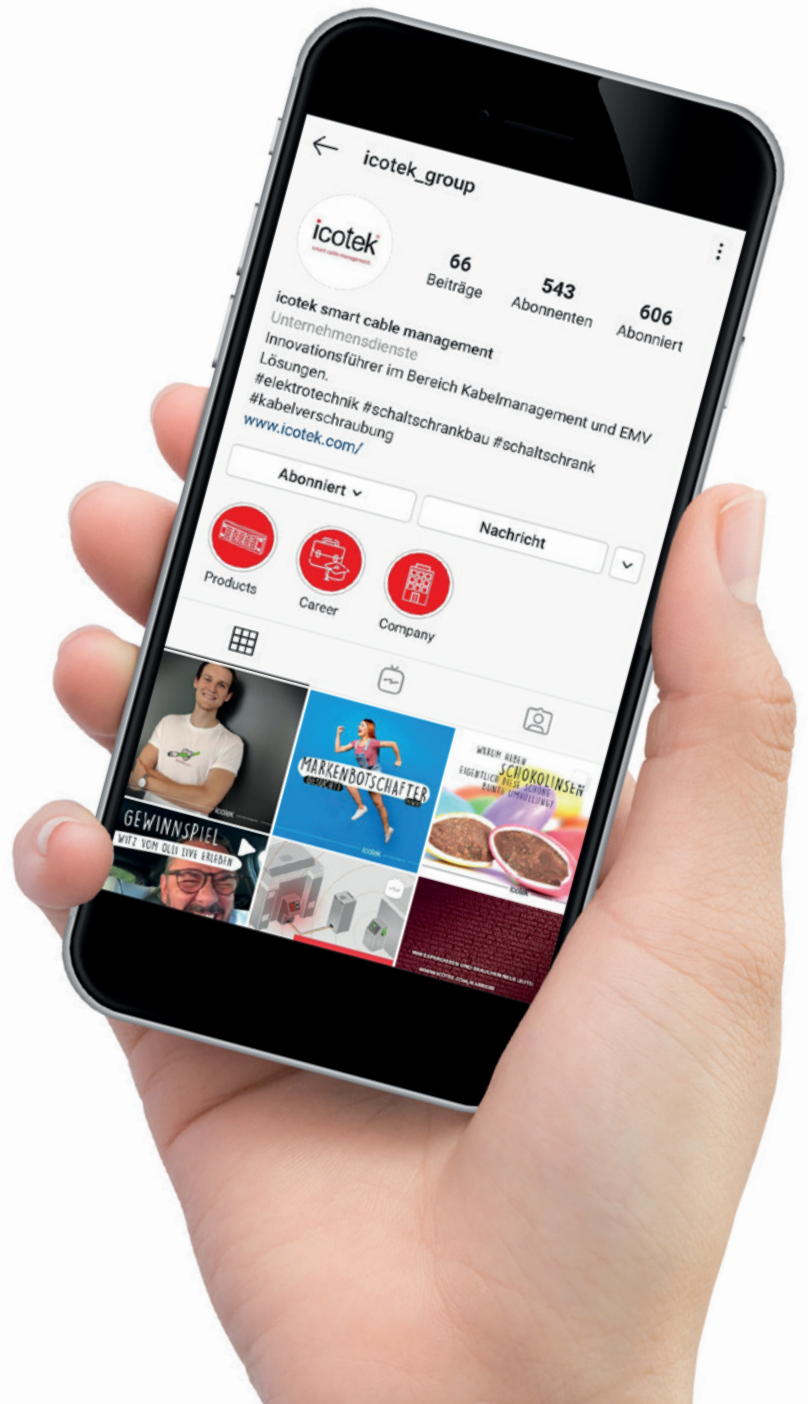
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